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NOTE.—Communications relative to the editorial management should be addressed to Mr. ROTHWELL. Articles written by Mr. RAYMOND will be signed thus *

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CONTENTS.

EDITORIALS:
American Institute of Mining Engineers 307
Dr. Isidor Walz 307
Silver Dollars.—V 307
Water Level 308
New Publications 308
The Rothschonberger Stollen 308
Valley of Colorado River.—XIII 310
The Condition of the Carbon in Chilling Irons 310
Classification of Coals 311
Lectures on Mining.—No. LIII 312
Mechanical Treatment of Metals 312
North Shore of Lake Superior 313
PETROLEUM NOTES 313
Production of Anthracite Coal 315
Index of Current Technical Literature 316
NOTES:
Terrible Colliery Explosion in Scotland 309
Flooding of Goodrich, Ont., Salt Mine 316
Old Lightning Rods 316
Large Transfer of Ohio Coal Lands 316
Production of Manganese in Louisiana 316
Reduction of British Laborers' Wages 316
Strike of Staffordshire Colliers 316
Failure of the Bay State Iron Company of Boston 316
Assay Department 316
COAL TRADE REVIEW 317
IRON MARKET REVIEW 319
METALS 320
Salt Lake City Ore Market 320
FINANCIAL:
New York Stocks 320
Philadelphia Stocks 320
Copper Stocks 321
Gold and Silver Stocks 321
Gas Stocks 323
Advertisers' Index 324

The meeting of the American Institute of Mining Engineers, we learn from Amenia, was very successful in spite of some intervals of bad weather, which did not, however, prevent some delightful excursions. The attendance was considerable, many interesting papers and debates characterized the meetings, and the hospitality of citizens, mine and furnace owners, railway companies, etc., was unbounded.

DR. ISIDOR WALZ.

As we go to press the news of the death of Dr. ISIDOR WALZ, last Thursday morning, reaches us. With a natural predisposition for consumption, his untiring zeal and devotion to the cause of science laid the germ of the fatal disease. Dr. WALZ was well and favorably known in this city as an expert chemist, and as editor of the *Manufacturer's Review* and *Industrial Record*. In company with a few others, Dr. WALZ some years ago founded the American Chemical Society, and until his death remained an officer and active member of that organization. The success of the society is in a great measure due to his efforts in its behalf, and the association loses by his death an earnest worker.

SILVER DOLLARS.—V.

ARISTOPHANES noticed the fact that two kinds of money of unequal value cannot be forced by law to remain in circulation together, and ascribed the driving out of good money by bad to the depraved taste of his fellow-citizens, which led them to prefer the bad money. There have been so many instances of the same phenomenon in the financial history of all nations that one might naturally expect the world to have become by this time at least aware of the fact, whether it could understand the reason or not. But every generation breeds its visionary theorists and reckless demagogues, who take up the problems of finance with the air of being the first discoverers of them, and propound anew the fallacies which logic and experiment alike have repeatedly refuted.

The "silver dollar" is now, as we have shown, merely the lid to a kettle containing a hotch-potch of parties. Out of the seething mass comes much vaporous theory, and an occasional unsavory whiff of repudiation. It is hard to determine whether the substance of the dish be fish, flesh or fowl. But, though precisely such a mixture may never have been stewed before, it is safe to say that every single ingredient of it is historic refuse—the "cold victuals" of former generations.

The eighth volume of MACAULAY's History contains some instructive and amusing matter pertinent to this subject. We there find that the politicians of the seventeenth century marveled exceedingly that everybody should be so perverse as to use light money in preference to good money. "In other words," says the historian, "they wondered that nobody chose to pay twelve ounces of silver when ten would serve the turn." If our silver party should succeed in octroying upon us any one of the dollars of our fathers, by way of facilitating, as some of them pretend, the resumption of specie payments, they would doubtless be heard marveling that people obstinately kept gold out of circulation, and that specie payments brought about a scarcity of money.

We read also that the most troublesome class of opponents to the necessary reform of the British coinage were those who insisted that the new shilling should be worth only ninepence or ninepence halfpenny. Even Mr. Secretary of the Treasury LOWNDES, it appears, "was not in the least aware that a piece of metal with the King's head on it was a commodity of which the price was governed by the same laws which govern the price of a piece of metal fashioned into a spoon or a buckle, and that it was no more in the power of Parliament to make the kingdom richer by calling a crown a pound than to make the kingdom larger by calling a furlong a mile." Moreover, "he had a considerable following, composed partly of dull men who really believed what he told them, and partly of shrewd men who were perfectly willing to be authorized by law to pay a hundred pounds with eighty."

The philosopher LOCKE, in his essay, "Concerning Raising the Value of Money," answered this fantasy with arguments which are as valid to-day, and almost as necessary, as they were at that time. Fortunately the party of the "little shilling" was defeated, as we trust the party of the little dollar will be. But its mere existence greatly aggravated the evils of the debased currency. "Of course every person who thought it likely that the standard would be lowered hoarded as much money as he could hoard; and thus the cry for little shillings aggravated the pressure from which it had sprung.

We have just passed the anniversary of that 20th of October, 1696, which MACAULAY pronounces to have been one of the proudest in the history of the English parliament. Of the three memorable resolutions, passed after "a debate which resounded through all Christendom," the second declared that the standard of money should not be altered in fineness, weight or denomination. And within four days there was relief to industry and new life in trade.

We stand in a similar, though not identical, crisis. With us, indeed, the tide has already begun to turn. Politicians have not the same plausible pretext for demanding as they demanded a hundred and eighty-one years ago, that the distress of the country shall be medicated with more and larger doses of the poison that caused it. We have passed the crisis. The cure has begun without medicine, and all that is now needed is a firm adherence to the regimen of convalescence, and an early abandonment of slops for solid food.

We need scarcely stop to prove that what the debasement of the standard of coinage would have been in 1696, the return to a depreciated standard would be now. The question of bi-metallism may complicate the application; it does not change the principle.

A hundred years later, in 1797, the Bank of England suspended specie payments; and when after a quarter of a century of paper money, the time for resumption was fixed by law, the condition of parties again presented features not without pertinency to the present situation in this country. There were those who disclaimed against contraction; and there were those who insisted that the public debt should be paid in a depreciated currency, because it had been incurred in a depreciated currency or with heavy discount. Of the first party, GERVINUS, in his "History of the Nineteenth Century," says, in words which we translate as equally applicable to our own time, "One vague notion especially had taken possession of men, since the bank had suspended specie payments in 1797, that the high war-prices had been caused by the excessive increase of bank notes and their consequent depreciation, and that all following variations in prices could be explained by corresponding changes in the paper circulation. The proportion of the entire amount of notes in circulation to that of the checks and drafts afloat at any one time (to say nothing of the amount of these issued during a whole year), was indeed always so insignificant that this fact alone should have rendered evident the small effect of the paper money on the course of prices."

No doubt the existence of an inflated currency of irredeemable paper is an unmitigated evil. That it maintains high prices, however, no one can claim who sees how prices have fallen in this country with a plethora of currency. It is logical to conclude that the contraction of it to its proper limits, and the resumption of coin, will not further reduce prices. The country has nearly readjusted its industry to the low prices, which must hereafter prevail, because the era of war and speculation with its fictitious values has passed away. To repeal the resumption act, and start for another voyage on the waves of financial restlessness and uncertainty, will not help, but hinder the normal recovery of business.

The politicians of England charged that the depression of business in 1814–16 was due to an alleged contraction of the currency; that the rise of prices in 1816–18 was due to the postponement of specie resumption, and a consequent expansion of the paper currency; and that the depression of 1819 was due to the impending resumption, which was then resolved upon in earnest. But the truth is that the alleged contractions and expansions had been largely or wholly imaginary; and the effect of a firm movement to resume coin payments and to contract in earnest was precisely the opposite of what had been grimly prophesied. Specie payments resumed themselves. The bank antedated by a year the period fixed by the law, and business entered upon a course of unexampled prosperity from the moment which had been sagely fixed for its utter collapse.

Repudiators of all kinds were not wanting in those times. Such agitators as COBBETT "staked their lives" that contraction and resumption would bring ruin, or propounded schemes for cheating the "bloated bondholders" of the day. Among these schemes may be found the inevitable notion of tinkering the coinage. To give the creditor of the government a little shilling instead of a large one was then, as now, a favorite idea with speculators in public delusions.

Already it is intimated that the silver party in Congress, unable, perhaps, to agree upon any positive measure, will force through the House the repeal of the Resumption Act. We trust that the Senate will stand firm against this folly, and in the last resort that the President will veto it. If the effort to postpone

resumption fails, we suppose some sort of a silver dollar will be devised by the House. But nothing will suit the clamorous advocates of "cheap money" save a *depreciated* dollar. The anticipation of such a practical debasement of the currency is, we think, even now a depressing influence in business circles. It will become still more so if the probability of such a measure becomes greater and draws nearer.

Who would profit by the coinage of a silver dollar worth 90 cents and made a legal tender? Those who own gold, those who own silver, and those great corporations which owe millions upon millions of money. Who would lose by it? First and foremost the workingmen, so many of whom are blindly demanding it. *

WATER LEVEL.

Staff Correspondence of the Engineering and Mining Journal.

There appears to have been another outbreak of theories regarding the "water line," and this time it is a California professor who has expended his energies on the subject. In the San Francisco *Bulletin*, which prints an abstract of his lecture, we find the following remarks:

"Speaking of the gold and silver mines of Nevada and Utah, he explained the nature of the water line, and spoke of the different forms in which metals were found above, below, and on it. Below the water line, he said, silver would always be found in sulphide, that is with sulphur. As we proceed upward on the water line, we find it as a sulphate, and above the water line it is to be encountered as an oxide, or compounded with oxygen, with a base destitute of acid or salifying properties."

If examples were shown that would corroborate these ideas, the professor's statements might have weight, and the deductions which are made from them would possess a certain value. It is one of the easiest matters imaginable to theorize on the subject of vein formation and geology in general—so easy, that it is a temptation to all who have had experience in our locality to reason from observations there, taking those for example as a "base line," and proceeding to triangulate over the whole field.

More than any other portion of a mineral vein, the so-called water line is called upon at present to account for peculiarities of construction and anomalies in filling. At one time slickinsides or glazed walls were the favorite foot-balls of the theorists. These were claimed to prove and influence all desirable conditions, to demonstrate infallibly the "true inwardness" of the ledge, and to point to bonanzas with the supposed certainty of a divining rod. Again, the porphyry dyke has had its day as a supposed certain indicator of the richness of a vein, and following that, in their turn, the dip and strike and underlie have been the sport of the philosophers. Last of all are the numerous theories based on the water line.

What then is the water line? According to the professor we have quoted it is an invariable boundary above which the natural water existing in a mineral ledge does not rise, and below which the contents of the lode may be supposed to be in a state of eternal dampness. Presuming such a condition to exist, it is, of course, a simple matter to determine effects. Below the line the filling of a vein will be mainly unaltered. Directly at it disintegration and decomposition of ore will occur, and above it the latter processes will be pushed to their utmost limits. The Californian whom we quote states that silver below this line will always be found as a sulphide, yet every intelligent miner on the coast has his cabin full of specimens of the native metal, taken from all depths, and if he gives the matter a moment's serious thought will see the falsity of such a conclusion. Above the water, as every miner likewise knows, silver occurs as often in a state of sulphurets as pure, and certainly never exists as a sulphate, so that the professor's deductions do not stand at all.

Let every miner to whom the subject has an interest look around among the miners in his own camp, and see whether the facts will bear out the theory. Adjoining the mine which was drowned out at 50 feet from the surface he will find one which was completely dry to the depth of 100 feet, and next to it another which, though opened 200 feet, is still quite dry (excepting from surface water in spring). Again, close by will be another which required bailing 10 feet from the surface and has always been known as damp. Again, as to ore, every practical miner of common sense knows that his vein is not uniform in the quality of its mineral anywhere; that he finds native metal in the outcroppings and 500 feet deep, and, as a rule, that after he has sunk ten feet all his ore requires roasting, and consequently is rich in sulphur.

If the country rock is loose, seamed, stratified or in any way shaken up, it will be full of water courses, which will connect with the mineral veins at all depths, and render the district a damp one. On the other hand, if the rock is solid, the seams will be completely dry.

NEW PUBLICATIONS.

In *Harper's Magazine* for November, Mrs. JESSIE BENTON FREMONT commences a series of sketches, entitled "A Year of American Travel," in which the early days of California, and the route thither, are depicted with that light and fugitive touch of which this lady is mistress. The first number leaves the reader at Panama, after a picturesque isthmus trip, such as was only possible before the railroad days. The character of the author is not concealed in the work, which is charmingly autobiographical. Every line reveals the daughter of "Old Bullion" and wife of "The Pathfinder."

The magazine contains also the usual entertaining and instructive miscellany. Among the illustrated articles is a well-written one on ROBERT HOUDIN, the conjurer, which gives a highly interesting account of the man, "his tricks and his manners." The explanations of the juggler's wonders might have been furnished by a member of the profession, so clearly are a number of mysteries explained which have long been no mysteries, and so neatly are exposures avoided which would damage the present business of the magic stage. Indeed, though we have never seen HOUDIN'S book, we suspect that this article is made up from it. But it is cleverly done, and likely to fascinate both old and young. *

THE ROTHSCHONBERGER STOLLEN.*

By R. W. Raymond.

The 12th of April, 1877, witnessed the celebration at Freiberg, Saxony, of an event profoundly important for the ancient mining industry of that district, and full of interest to mining engineers throughout the world—namely, the connection of the famous Rothschönberger Stollen with the Freiberg mines. Since the invention and perfection of steam machinery for pumping, winding and ventilation, the supreme importance formerly conceded to deep adits has declined. Yet such works still remain in many cases measures of true economy; and the instance just referred to furnishes a striking example of a vast undertaking steadily pursued through many yearrs, and completed at last just in time to afford vital relief to a declining industry, which has lasted through seven centuries.

To engineers it is also interesting, as furnishing another proof (if any were needed) of the efficiency of machinery in works of this character.

I have thought, therefore, that a brief description of this adit, together with tabular exhibits of its progress and cost (for the material of which I am chiefly indebted to Mr. Adolf Mezger, Mining Engineer of Freiberg) would be welcome to the members of the Institute.

Already in the last century the difficulty of dealing with subterranean waters had caused the abandonment of some of the most important groups of mines around Freiberg. To those acquainted with the locality I need only mention the Halsbrückner Spatgang, the Thurmhofer Zug, and the Hohebirker Zug. In the first quarter of the present century, it was evident that mines at other points in the district would suffer a general decline and certain final cessation of active operations from the same cause. The use of steam-power was deemed too costly for an industry based upon small veins and ores mainly of low grade. A deep adit was the only other remedy; and in 1838 Oberberghauptmann von Herder published his famous plan of the great Elbe adit (*der tiefe Meissner Stollen*), which, starting from the Elbe at Meissen, should pursue a straight course to Halsbrücke, a distance of 22,000 meters. At that point it would drain the ancient and abandoned mines belonging to the state, and beyond that it could be continued and connected with the various deep mines of the Freiberg district at the cost of the parties benefited. The depth of this adit below the deepest then existing would have been about 183 meters.

As is well known, this plan was finally abandoned, as requiring too much time and money, and in lieu of it the Freiberg authorities urged upon the government in 1843 the undertaking which has recently come to a successful end. This plan, the execution of which was commenced in 1844, and has been steadily continued for nearly 33 years, contemplated an adit from the Triebisch valley, at Rothschönberg, about 12 kilometers above Meissen on the Elbe. The distance to Halsbrücke was to be 12,882 meters (exclusive of 334 meters of auxiliary drain); the depth below the Anna Stollen 94 meters, or 89 meters less than that proposed for the great Elbe Stollen; the height and width of the adit 3 meters respectively, and the grade 3 millimeters to the meter. The adit was to be prosecuted from the mouth and from seven air-shafts; the estimated time required was 22 years; and the estimated cost was 1,300,000 thalers, or $950,000 gold. Both the time and the money were considerably exceeded, as will be seen by reference to the details given below. The causes of this disappointment (nothing unusual, by the way, in enterprises of this character) were unexpected hindrances and difficulties of every kind. Among them may be mentioned the penetration by the first air-shaft of an ancient ravine filled with quicksand; the encountering, in the different headings driven, from the air-shafts, of unlooked-for quantities of water; and a change of plan, in the interest of the Halsbrücke mines and those of the Freiberg district beyond, involving an eighth air-shaft and an increase in the length of the government adit—the new length being (inclusive of 846·84 meters auxiliary drain) 13,900·79 meters. Moreover, the originally estimated cost was appropriated in nearly equal instalments annually—to the great delay of the work in the first few years, when the sinking of shafts, the erection of buildings, and the purchase of machinery consumed large sums. The influx of water above alluded to necessitated the erection of more powerful machinery, and suspended actual progress in the meantime. Experience has shown in this instance, as in the striking instances furnished by the Sutro Tunnel and the deep mines on the Comstock lode, in our own country, that it is not safe to presume on the absence or small quantity of subterannean waters, even at depths below those in which the mines are comparatively dry. The amount of water continually standing or circulating at great depths in the earth's crust is a matter concerning which little is known or speculated; but reflection will convince us that it must be very great, since nothing but absolutely impermeable and insoluble rock (if such exists), or a zone of heat too intense to permit the existence of water as water, can form its lower limit. The effect of such an all-pervading agent in the metamorphosis of rocks under high pressures and at great depths is a subject most interesting to geologists, and not yet exhausted. The possible ascription of the increasing heat encountered as we penetrate the earth to the reaction of water upon the rocks and minerals, is likewise a most inviting topic, upon which I shall not enter here, further than to say that whatever may be the lack of evidence for such a theory, it cannot well be urged against it that water does not exist in the deep strata in sufficient abundance to permit such action to take place on an adequate scale. The indications of experience are rather the other way, although the greatest depths attained by human explorations are trivial in comparison with the dimensions of the earth, and can scarcely give conclusive evidence on either side.

But one of the greatest causes of delay and expense in the construction of the Rothschönberger adit was an element which I do not find set forth in the congratulatory speeches of the orators who celebrated its completion. I refer to the steady decrease in the efficiency of the workmen. Perhaps the Freiberg district is not alone in this respect; but certainly the day's work of a man has diminished there to very unsatisfactory proportions. This is due partly to the fact that as the industry declined, the younger men have sought their fortunes by emigration, until the government works have come to be almost an eleemo-

* A paper read before the American Institute of Mining Engineers, at the Wilkes-Barre meeting, May, 1877.

synary institution for the support of decayed and superannuated veterans. But this is itself an effect as well as a cause. The policy of paternal government, with its adjuncts of pensions, insurances, regulated labor, and the like, has many good features; but the danger in all such systems is the gradual loss of independence and ambition on the part of the laborer, and conversely the loss of such laborers as possess these qualities. In many foreign states, the government has planned anxiously to prolong work for the miners of certain ancient, half-exhausted districts. What more natural result than that the miners, catching the infection, should plan to prolong work for themselves, nursing every job to make it pay wages as long as possible? The interest of society is to save labor. The immediate interest of the laborer is to sell labor. And this is the root of the contest between capital and labor. No doubt the laborer often seeks his immediate interest at the sacrifice of his permanent interest, or that of his class and country. In the present case, for instance, the slow and lazy progress of the deep adit, while it prolonged the occupation of a few men, delayed the commencement of a new era of activity throughout a considerable area, which will give occupation to many men. As might be expected in such an atmophere, the modern improvements in drilling and explosives were not adopted. Experiments were made by the skillful engineers who abound at Freiberg, and reports of value were published; but a vigorous adoption of the new labor-saving agents did not take place. The exodus of labor to more promising fields had left the Freiberg miners in such a condition that the discharge of a miner for mere laziness and inefficiency was regarded as a sad, last resort. To force upon the miners improved machinery and explosives, was a step too daring for the authorities, who, having coddled their laborers into insubordination, were now at their mercy. I think it was in 1875 that the unfavorable report upon the use of machine-drills in the Himmelfahrt mines was given to the world. In the same year Mr. Adolph Mezger, a mining engineer known to many members of this In-

a header already connected with the tunnel mouth. Nevertheless, there remains an surplus of progress in the American work which I feel justified in ascribing to the superior efficiency of our miners and laborers. On the other hand, the cost of the work is much greater with us, by reason of the higher wages. But, if time is money, as it certainly is in such a case, the higher cost may be more than balanced by the greater speed.

The criticisms in which I have indulged concerning the general ineffectiveness of hand labor in this district should, no doubt, be modified by many individual exceptions. One remarkable and interesting case deserves special mention, namely: That of a gang of Italian laborers who were set to take down the roof or top-heading by hand, after the main heading had been driven by machine drills. This top-heading had the whole width of the adit and was one meter high. The workmen developed surprising skill and endurance in drilling vertical upward holes, the drill being upheld and set by the holder, while the striker in a standing position, swung the sledge, weighng ten to fourteen pounds, and delivered the blow upwards at the end of the swing. In this way forty-seven meters of linear progress was achieved in the last nine weeks, or a littler over five meters per week, in the ordinary Freiberg gneiss. This rate was much in excess of that which had been previously achieved with German workmen; but it must be noted that beside the peculiar method and perhaps greater activity or willingness of the Italians, they used dynamite, which the natives had disliked to employ. Two or three holes sufficed to take down the section of two meters across the adit.

The following tables give an outline of the progress of the work since the commencement. From the mouth of the adit to the first air shaft the rock is a sort of clay slate. The rest of the adit is in gneiss. There is no timbering. The adit stands in solid rock, except at the intersection of veins, where it is protected by brick or stone masonry.

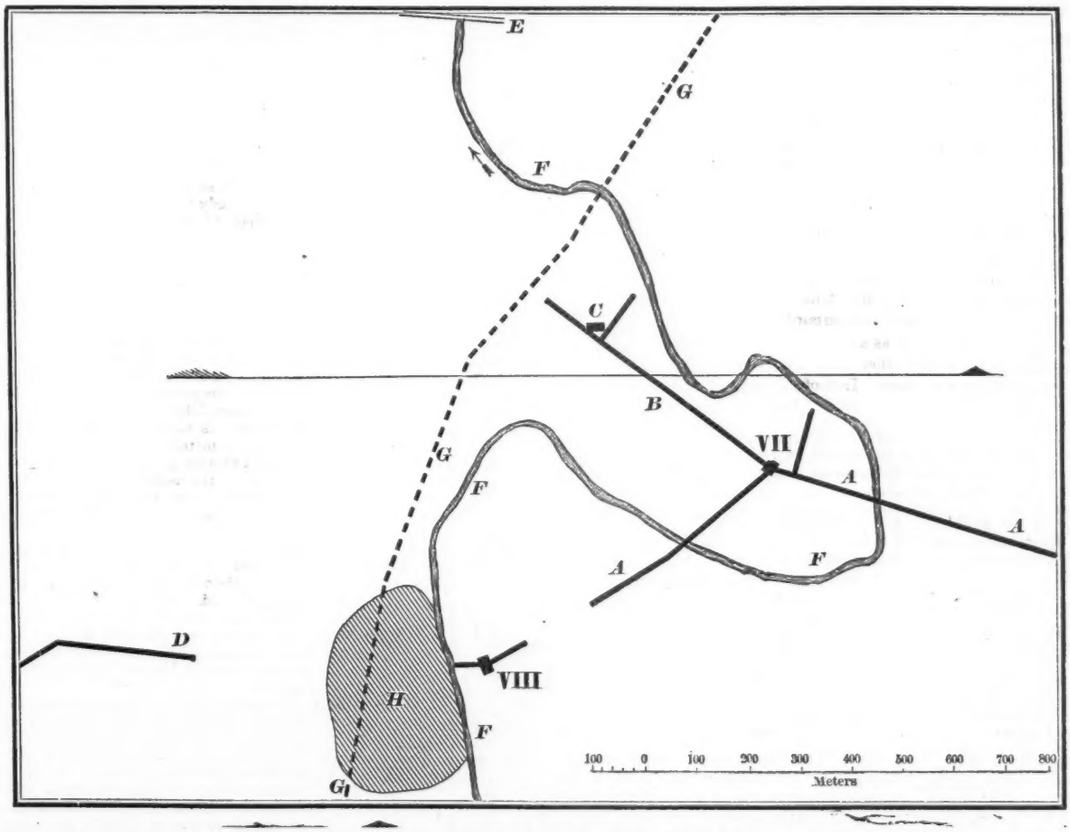


Diagram showing the final work on the Rothschönberger Adit. True meridian. AA, main adit; B, branch to C, Beihilfe shaft; D, counter-heading from Himmelfahrt mine; E, Allväter aqueduct; F, course of the Mulde; G, Johannisbruch and Halsbrückner Gang; H, Location of Halsbrückner Smelting Works; VII, VIII, air shafts.

stitute, whose years of practice in this country, Russia, Mexico and Greece had enabled him to perceive, and whose native energy urged him to adopt, whatever was most effective in methods and machines, took a contract to finish the Rothschönberger adit. The condition of the work in October of that year is show by the accompanying sketch. Air shaft VII. was fully connected with the main tunnel. Air shaft VIII. was not connected, and required constant pumping. The work of connecting these two shafts was slowly progressing; and the continuation southward from shaft VIII. to meet the counter-drift from the Himmelfarht mine, a distance of about 250 meters, was the work undertaken by Mr. Mezger.*

After much annoying delay, and in the face of no little opposition, he got under way, employing Burleigh drills. Before the contract was completed, he had succeeded in maintaining a regular rate of progress of 6 meters a week (3 meters high by 3 meters wide), or say 84 feet per month. This, under the circumstances, must be considered excellent work. The Sutro tunnel header advanced in 1875 at the average rate of 94·7 meters (310·7 feet) per month, the best month's work being 112·6 meters. In 1876 the average monthly rate was 93·2 meters, and the best month's work 109·6 meters. But the rock in the Sutro tunnel is less refractory than the Freiberg gneiss; the section of the Rothschönberger (3 meters square) is one-fifth greater than that of the Sutro (8 feet by 10 feet), and the difficulty of working from an air-shaft is considerably greater than that of driving

The work, down to the end of 1875, was done exclusively with hand labor and common powder. Generally a gang of 15 men (five in each shift of eight hours) was employed. Occasionally this number was increased, even as high as twenty-eight men, distributed in six-hour shifts. The work done with the aid of the machine drills required two Burleigh drills, one of which was held in reserve, and nine men, in three shifts. Two shifts worked with the machine drills and one by hand in the top-heading.

TO BE CONTINUED.

* Among the honors distributed at the celebration, Mr. Mezger received, in recognition of his skill and energy in completing the work, the decoration of the *Albrechtsorden*.

Terrible Colliery Explosion in Scotland.—A dreadful explosion of coal gas occurred at nine o'clock on the 22d inst. in the High Blantyre Colliery, near Glasgow. Two hundred and thirty-three men descended into the pit when work began, and it now seems certain that all but four have perished. A despatch dated Glasgow, Oct. 23, at 1 p. m., says the shaft at the bottom of which the knocking was heard is rapidly collapsing. The explorers, consequently, are attempting to reopen communication from the other mine. They have penetrated about half a mile, but have still 150 fathoms to clear, so they cannot possibly reach the men who are supposed to be imprisoned before morning. This is one of the most disastrous explosions of which we have any record. In 1862 the fall of a portion of the shaft at the Hartley colliery in England, cost 202 lives; 180 men were killed at the explosion in the Lundhill mine, also in England, in 1857, and 110 at the Avondale disaster, in Pennsylvania, in 1869. The explosion of fire-damp in the Felling colliery at Newcastle, England, in 1812, resulted in the death of 92 miners.

THE VALLEY OF THE COLORADO RIVER, AND ITS GEOLOGY.—XIII.*

CLIFFS AND SLOPES OF DISPLACEMENT.

On to the east, for thirty miles, and we reach the eastern brink of the Kaibab Plateau. Descending 1,500 feet, we have a bench three or four miles wide, and make a second descent of fifteen hundred or eighteen hundred feet, when we reach the eastern foot of the plateau, and stand on the plain above Marble Cañon. To the south, these eastern Kaibab steps have escarpments, as the displacements are by faults. To the north they have slopes, as the displacements are by folds.

Then we cross the plain, and still go on to the east for a distance of thirty-five or forty miles, and reach the foot of a line of cliffs facing the west once more.

Climbing this, we find it to be a sharp ridge, with the face also turned to the east, so that we have two lines of cliffs or escarpments, one facing the east, the other the west, brought so close together as to form a sharp ridge. The eastern face is due to erosion; the western face, to displacement by folding. I shall hereafter discuss this ridge in a more elaborate manner.

The Grand Wash Valley is a desert of broken rocks and naked sands. There are two or three springs in the valley, and here squalid Indians live in a region so warm and so arid that they are not compelled to build themselves even shelter of bark and boughs, but wallow in the sand, or seek the shade of the few scrubby cedars that grow from the crevices of the rocks.

The *Shi-wits* Plateau is naked and desolate, but here and there springs burst from beneath the basaltic cliffs, and deep gulches and cañons are cut from its margin, and run into side canoñs of the Colorado. About these springs, and in the deep gulches of the *Shi-wits*, Indians live, cultivating little patches of corn, gathering seeds, eating the fruits and fleshy stalks of cactus plants, and catching a rabbit or a lizard now and then; dirty, squalid, but happy, and boasting of their rocky land as the very Eden of the earth.

In the region above the Hurricane ledge there are extensive grazing lands, and where there are a few springs, which can be used for irrigation, the Mormon people have succeeded in raising the products of a temperate climate. In the region below there are two or three small towns along the course of the Virgen and Santa Clara rivers, where the inhabitants have succeeded in cultivating subtropical products, and you can throw a stone from the land of the potato and apple to the land of the fig and sugar-cane.

Of this great table-land, immediately north of the Colorado River, there is a group of mountains and volcanic cones, known as the *U-in-ka-rets*, of which mention will be made hereafter.

The benches I have described are steps in the great stairway to the Kaibab Plateau, where the clouds yield there snows even in July, and the moisture of this upper region has disintegrated the rocks, and formed a soil which gives footing to vast pine forests. Springs of water abound, beautiful lakes are scattered here and there, and meadows, clothed with verdure give pasturage to herds of deer. This is the summer home of the *Kai-vav-its*.

The plain between the foot of the Kaibab Plateau and the Echo Cliffs, along the Paria Fold, is naked and desolate. Through its center runs the deep gorge known as Marble Cañon, with its many side cañons and gulches.

On the eastern slope of the Echo Cliffs a number of springs are found, and these are famous watering-places for the Navajo Indians.

The western slope of the range is composed of homogeneous, but rather friable, sandstone, and the rain-water rills have corraded deep channels, interrupted by many pot-holes. After a shower, these pot-holes are found filled with water. There is a place, near by the trail which passes from the mouth of the Paria to the Province of Tusayan, where there is a collection of these water-pockets, known as the Thousand Wells.

(The plateaus and tables, the faults, and folds, and the escarpments, due to displacement and erosion, are exhibited in bird's-eye view Fig., and also in section and bird's-eye view Fig.)

CLIFFS OF EROSION.

I have said that the upper surface of the district adjacent to the Grand Cañon is the summit of the rocks of carboniferous age. North of the Grand Cañon, from forty to sixty miles, we find rocks of later age standing in cliffs, the escarpments of which face the south. There are four lines of these, preserving, in their courses, a general parallelism. Going north from the Grand Cañon we first meet with the *Shin-ar-ump* Cliffs, a step to a bench—low, and much broken. Capping the cliffs, we find conglomerate, over which are scattered many fragments of silicified wood, known to the Indians as the arrows of *Shin-au-av*, or *Shin-ar-ump*. Still proceeding north, we come to a second line of cliffs, with soft beds below, and harder beds above, known as the Vermilion Cliffs. The rocks exposed in these two lines of cliffs have been, by courtesy, called Trias, but without sufficient paleontological evidence. The third line of cliffs has a gray, homogeneous sandstone at the base, and a capping of limestone, containing Jurassic fossils. Above this line we have many hills, carved out of beds of cretaceous age, and above and beyond these hills a line of cliffs, the summit of which is of Tertiary age. The faces of these upper cliffs are stained with red oxide of iron, and they are called the Pink Cliffs. The dip of the beds is to the north; the strike east and west; and as these are cliffs of erosion, they follow the strike in a general way, and hence have an easterly and westerly trend.

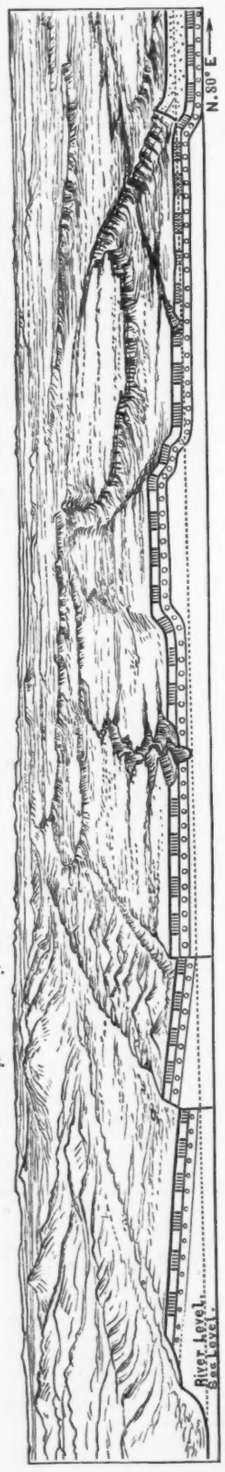


Fig. 34.—Section from West to East across the Plateaus, North of the Grand Canon, with bird's-eye view of Terraces and Plateaus above.

Horizontal scale, 16 miles to the inch; vertical scale, 4 miles to the inch.

* Extracts from Report of Major J. W. Powell on *The Exploration of the Colorado River of the West*. Washington, 1875.

THE CONDITION OF THE CARBON IN CHILLING IRONS.

To the Editor: Sir—Seeing in your issues of the 22d and 29th of September an article by Mr. Boussingault on "The Limit of the Carburation of Iron," I thought that, perhaps, the analysis of the chill and plate of a few of the car wheels which I have made might be interesting to some of your readers.

My analysis confirm the analysis of Mr. Boussingault, in that the white or chilled iron contain more carbon than the gray iron or plate of the wheel, and also the difference between the respective carbon in each, viz., between one-tenth of one per cent. and two-tenths of one per cent. But I find more carbon both in car wheels and in car wheel irons than Mr. Boussingault gives as the limit of carbon in iron.

The following is the amount of total carbon which I find in the chill and plate of three car wheels which have run between 40,000 and 50,000 miles:

	CHILL. Per Cent.	PLATE. Per Cent.	DIFFERENCE Per Cent.
A.....	4,050	3,906	·144
B.....	4,145	4,023	·122
C.....	4,222	4,172	·204

As to the state of the carbon in white iron, I beg leave to differ from Mr. J. Lowthian Bell, who says that the difference between white and gray iron is due to the fact that the graphite in the latter is in large crystals, while the crystals in the former are firm. He also gives analyses of white iron, which contain more than one per cent., and one or two analysis where the graphite is over 2 per cent. In all the white iron and chilled iron which I have analyzed within the last two years, I have never found more than from 0.1 to 0.2 per cent. of graphite, and even that amount I am inclined to believe is partly due to a small amount of gray iron, which was mingled with the white iron, it being almost impossible in taking a sample of the chill of a wheel to get the white iron entirely free from the gray, owing to the fact that in a hard chill the gray and white irons are so interlocked, and change so gradually from the one to the other, that it is almost absolutely impossible to obtain a piece of white entirely free from gray iron, except on the surface of the tread of the wheel.

It may be that Mr. Bell took all of the carbonaceous residue obtained by dissolving iron in hydrochloric acid as graphite; if so, he is entirely wrong.

If chilled iron is dissolved in hydrochloric acid and immediately filtered, there will appear a large amount of carbonaceous matter along with the silica; if this residue is washed with the warm dilute potash to dissolve the silica, the filter will then be seen to contain material which more resembles dried black varnish than graphite in appearance; it has no distinct crystals, and is volatile at a dull red heat, showing that it is no graphite.

Now, if this solution of iron, instead of being filtered immediately after the iron has been dissolved, be evaporated to dryness, and the chloride of iron decomposed at a low heat in a sand bath, it will then be found that, after redissolving the oxide of iron in hydrochloric acid, there will be the same amount of this carbonaceous matter, but on washing the filter with warm dilute potash, all of this material will be dissolved, and there remains in the filter only small crystals of carbon, which correspond to the amount of graphite which is obtained by dissolving iron in nitric acid of 1.21 sp. gr., at a temperature of 80° C. But I have found that in estimating graphite by nitric acid, the residue obtained must also be washed with the dilute potash, as it always contains more or less of this extractive matter. I find that the greater the quantity of this material there is in an iron, the greater the chilling property of that iron. This material seems only to be found in chilling irons. I have noticed this behavior of carbon in chilling irons for some time past; but I have had it more forcibly brought to my notice within the last two months.

I have been examining three samples of cold blast charcoal irons, numbers 1, 2, and 3, and three samples of warm blast charcoal irons of the same grades; these irons were made at the same furnace, from the same ores, etc., the only differ-

ence being in the warm and cold blast. All three of the cold blast chilled more or less on being melted, and then cast against a chilling surface, No. 3 chilling more, of course, than No. 1. But the warm blast irons do not chill at all except the No. 3, and that one only very slightly. I found that the cold blast irons contained a large amount of this extractive carbonaceous material, and No. 3 far more than No. 1, while in the warm blast, the only iron containing any was the No. 3, and that only a very small quantity. There are other points in chilling irons, together with a fuller account of this extractive material, which, I hope, soon to be able to make public. Yours truly,

S. A. FORD,

Chemist of the Pittsburg Car Wheel Works, Alleghany City, Pa.

CLASSIFICATION OF COALS.*

By Prof. Persifor Frazer, Jr., Philadelphia.

(*Concluded from page 295.*)

The following are some ratios calculated from the analyses made for Prof. Stevenson, and published in his report. It should be stated that many of the analyses from this report are included among the tables given above, which were provisionally arranged in their present order by Prof. Lesley to show the modifications of composition which take place in different parts of the same coal bed, and which become very apparent when expressed in the terms of fuel ratio, as an inspection of the fuel ratios of the Pittsburg bed in Washington and Somerset counties will show. The localities of many of the coals which here follow are the same as localities previously given, but when the analyses were not identical it has been considered worth while to place its fuel ratio here.

TABLE XVIII.

	Analyst.	Fixed Carbon.	Volatile Hydrocarbons.	$\frac{C}{V.\ H\text{-}C.}$
1. Henderson, near Taylortown, Buffalo Township, Greene Co, Pa.	A. S. McCreath.	55·01	44·99	1·22
2. Sayre's, below Waynesburg, Franklin Township, Greene Co., Pa.	"	54·66	45·34	1·20
3. L. Vernon, Jefferson Township, Greene Co., Pa.	"	58·41	41·59	1·40
4. Liddell, Centreville, Jefferson Township, Washington Co.	"	60·64	39·36	1·53
5. West Greenfield, Jefferson Township, Washington Co., Pa.	"	63·09	36·91	1·70
6. T. Redd, Fallowfield Township, Washington Co., Pa.	D. McCreath.	58 81	41·19	1·42
7. Thomas, Peters Township, Washington Co., Pa.	A S. McCreath.	55·49	44·51	1·24
8. Mrs. Bushfield, Cross Creek Township, Washington Co., Pa.	D. McCreath.	59·11	40·89	1·44
9. Patterson (roof coal), Centreville, Cross Washington Co., Pa.	"	58·32	41·68	1·39
10. Jefferson County, Ohio	Wormley.	61·45	38·55	1·59
11. Belmont County, "	"	63·46	36·54	1·73
12. " " "	"	66·14	33·86	1·95
13. Harrison " "	"	63·46	36·54	1·73
14. " " "	"	64·93	35·07	1·85
15. Athens, " "	"	60·92	39·08	1·55
16. Pomeroy " "	"	62·33	37·67	1·65
17. Potter's Bank, Raccoon Township, Beaver County, Pa.	A. S. McCreath.	58·07	41·93	1·38
18. Swearingen's, Hookstown, Beaver Co., Pa.	"	58·05	41·95	1·38
19. Todd's Bank, " " " "	"	54·08	45·92	1·17
20. " " " " " "	D. McCreath.	59·03	40·97	1·44
21. Wilson's, Shipping Point, " " "	A. S. McCreath.	54·61	45·39	1·20
22. Diehl's Bank, Georgetown, Beaver Co., Pa.	"	40·68	59·32	0·68
23. Bryan's Bank, " " " "	"	62·57	37·43	1·66

No. 1 is of the Washington Bed.
" 2 is of the Waynesburg Bed.
" 3 to 9 inclusive is of the Pittsburg Bed.
" 10 to 16 inclusive is of the Pittsburg Bed in Ohio.
" 17 to 21 inclusive is of the Upper Freeport Bed in Pennsylvania.
" 22 and 23 are of the "Ship Coal."

On comparing the first two tables it will be observed that Rogers has slighted his own general classification in the examples he furnishes of its various members, for if a semi-anthracite be characterized by a greater percentage of volatile combustible matter than a hard dry anthracite, then Nos. 1, 3, 4, 5 and 6 of Table II. do not belong there, since No. 16, Table I., has a higher percentage of volatile combustible matter than any of them according to his own tables.

But it is not in examples of this kind, where superior coals have been selected and submitted to analysis, that the urgency of a better basis on which to arrange them becomes most apparent. It matters not whether the article for which a place in the category is sought be a commercial commodity or not, its relation to the purer varieties of its own kind should be plain. An example will suffice to illustrate this.

A recent examination of the carbonaceous slates, known as the Hudson River group, and which form extensive terraces along the flank of the North or Kittatinny Mountain in this State, rendered it interesting to ascertain the quantity of carbon present in those slates, and also its nature. These slates, hundreds of meters below the true carboniferous strata and the carbon associated with them, with the underlying lower Silurian limestone, and with the still lower Huronian or Laurentine rocks, have generally been considered to be graphitic or at the least anthracitic.

Analysis, however, proved that these black strata contain about 3 per cent. of volatile combustible matter, 5 per cent. of fixed carbon, and 92 per cent. of impurities. If we neglect the latter the slate will by reason of its percentage of volatile hydrocarbons come under the head of the hard anthracites, whereas from the point of view above maintained the carbonaceous matter will be found to have the surprisingly high bituminous character of C 62·5, Vol. H-C. 37·5, a percentage hardly averaged by our best gas coals.

If it be true that a coal bed in its several parts, having been derived from mainly the same kind of vegetation (within reasonable limits of space) and being subjected to the same physical treatment within these limits, preserves a uniformity of composition in the product of that vegetation, some such method as this for withdrawing the accidents of the problem would seem to be an important means of identifying the same bed. For though the woody fiber may change into coal at the same rate in all parts of the same bed, the resulting coal will not be the same according to the presentation of it by the ordinary method of proximate analysis, unless the pressure and the resulting structure of the mass are the same; unless the waters and the infiltrating salts are the same in amount and kind; unless, in fact, all the accidents of a coal bed become essentials, which they never can do.

The argument of basing the definition of coals on the ratio between their percentages of fixed carbon and volatile hydrocarbons is founded upon the assumption that all other constituents than those of the fuel, *i. e.* carbon and hydrocarbons, are adventitious and accidental, and liable to be influenced by causes operating after the extraction of the coal from the mine. It is true that the coal plants themselves probably contained in their tissues silica, sulphur, water, etc., and may have contributed in some cases the larger portion of these substances which are found in the coal, but this does not alter the value of the method proposed. Each kind of vegetation no doubt produced its own kind of coal, but over wide tracts the resulting mass, from similar conditions of overflowing, imbedding, pressure and heat, would be practically the same *in the large*, while individual differences might be found in every mine (notably where a horse, a slate parting, etc., occurs).

But there is an essential difference in the result between two distinct causes of variation, *i. e.* (1) variation in the nature of the plant; (2) variation in the mechanical treatment to which the coal has been subjected. In the former case the coal is a *different* coal; in the latter a more impure variety of the *same* coal, as a deduction of its mechanical impurities and its fuel ratio will demonstrate.

If these tables here given may be taken as proper bases of the classification which essays to represent them, the definitions of these classes would be as follows:

An anthracite coal is one in which the ratio of fixed carbon to volatile (combustible) matter may vary between the proportions 99 C : 1 V. H-C. (theoretically, of course, 100 : 0), and 89 C : 11 V. H-C.

A semi-anthracite is a coal in which the ratio of the fixed carbon to the volatile combustible matter may vary between the proportions 93 C : 7 V. H-C., and 84 C : 16 V. H-C.

The semi-bituminous coals are those in which this proportion varies between 84 C : 16 V. H-C. and 81 C : 19 V. H-C.

The bituminous coals are those in which the proportion may vary between 80 C : 20 V. H-C. and 47 C : 53 V. H-C. To recapitulate:

TABLE XIX.

KIND OF COALS.	BETWEEN PROPORTIONS. C V. H-C.	C V. H-C.
Anthracite	99 : 1	89 : 11
Semi-anthracite	93 : 7	84 : 16
Semi-bituminous	84 : 16	81 : 19
Bituminous	80 : 20	47 : 53

On viewing this last small table, it will be at once seen that the classes overlap each other, and one is compelled to suppose that the coals which thus intrude on each other have some physical peculiarities which ally them to the class into which they come and separate them from the other. It will be in vain that we look for such distinguishing features, however, and the whole truth is, that the definition is based partly upon geographical and partly upon chemical characteristics. It is true that a hen never lays a duck's egg; but it is not true that a duck's egg is never found in a hen's nest, and this latter homely simile is applicable to all cases where minerals are concerned. It is a repetition of the old difficulty experienced by mineralogists of defining classes by other than strict chemical characters.

So long as no third term (*i. e.* percentage of water) is employed, the general results of these tables permit a very simple expression on Prof. Johnson's plan of fuel ratios. As a result of the digestion of all the above tables we have from experiment:

	$\frac{C}{V.\ H\text{-}C.}$		
Hard-dry anthracite	67·02	to	8·64
Semi-anthracite	12·75	to	5·41
Semi-bituminous	11·41	to	4·52
Bituminous	3·93	to	0·68

(Theoretically, of course, the first term of the left-hand column would be 100, and the last term of the right-hand column 0.)

The greatest confusion will be found to exist in the *semis*, a term which of itself implies a subordinate value in the system. First, the semi-anthracite encroaches upon the anthracite to the extent of 50 per cent. of its entire range.

But worse than this, the semi-bituminous covers the whole space assigned to the semi-anthracite, and actually encroaches upon the "*Hard-dry Anthracite*" about 40 per cent. of its entire range.

Such a state of our nomenclature cannot but interfere with that most desirable of all aids in the investigation of truth, a distinct and sharp definition of terms.

Would it not be as well to assign their places to these coals by fuel ratios, thus avoiding the perplexing variations of impurities, somewhat as follows:

	$\frac{C}{V.\ H\text{-}C.}$		
Hard-dry anthracite	100	to	12
Semi-anthracite	12	to	8
Semi-bituminous	8	to	5
Bituminous	5	to	0

It is true that the same objection might be found to this which was raised against the new iron nomenclature: that persons who had previously been selling coal, varying from 12 to 8 $\frac{C}{V.\ H\text{-}C}$ as anthracite, would resent the prefix of semi. But if, in the rectification of our boundary line, our neighbor's well is found on our land, it may be sad for him, but it is nevertheless unalterably true. Perhaps some of the expedients suggested by Mr. Howe in the iron discussion might be tried here.

It should be remarked, in conclusion, that so long as this point of view is selected for viewing coals, it is indifferent whether the per cent. of C, or the per cent. of V. H-C, or the quotient of one divided by the other, be selected as the best means of classification, since one of the first two data being given, the other two can be calculated; but this is a very different thing from basing the classification upon the per cent. of C or V. H-C, when the comparison of their sum with the impurities is neglected.

* A paper read before the American Institute of Mining Engineers, at the Wilkes-Barre meeting, May, 1877.

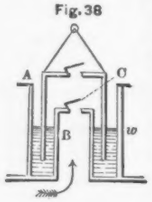
LECTURES ON MINING.—No. LIII.

By Prof. W. W. Smyth, M. A., F. R. S., Royal School of Mines, London.

AIR PUMPS.

We have seen in the last lecture that under suitable circumstances a vast volume of air can be carried through the workings by means of a furnace. We have seen also that there are other circumstances where a furnace is not so suitable, as for instance where is a great deal of water passing down the shaft, or where, for various reasons, the furnace cannot be placed at the bottom of the shaft, but must be more or less close to the surface. We found that the steam-jet had in some instances done good service, but that as a general means of ventilation it cannot be considered to come into comparison economically with the furnace. In the present lecture we have to look at a few of the contrivances which it has been proposed to introduce into mines for the purpose of mechanically exciting a draught. These have been employed from very early times; in the pages of the older works you will find a great many inventions of one kind or other. Among these are fans of various kinds, and in Agricola's book we may see these with simple wooden vanes, and others with feathers at their extremities, which were intended to force fresh air into one end of the mine, or to draw out the foul air from another. Before turning to these machines, worked by a rotary motion, we may conveniently look at some of the varieties of air-pumps which have been employed. The first is the machine which is called by the West Country miners the "duck" machine, or in Germany the "Harz Mine pump." This received in the early part of this century a premium from the Society of Arts, though there is very little reason to doubt that it had been in use for upwards of 100 years in other countries. It consists of an outer tube or box, (Fig. 38, A), within which is a pipe made of wood or sheet-iron (B), opening above by a valve working upwards, and communicating freely below with the pipe bringing back the return foul air. Between the outer and inner tube moves a third tube (C) up and down, open below, but with a valvular opening above; the lower part of this moves in water so as to prevent the escape of the air except through the valves. When the tube (C) moves up, the air to be exhausted passes through the valve of B, and is driven out through the valve of C, when that is again depressed. The frame C is attached by a frame of iron or chain to a lever, by which it is worked, and it may be so arranged that the lever shall have a pump at each end, thus being balanced. When this works on a moderate scale, from 1½ to 2 feet diameter, it is a very efficient little machine. It may be placed at the surface, or at the mouth of a level. This machine only wants to be made on a large scale to circulate a large quantity of air, and hence at a very early period something very like it was put up at the several mines in Belgium. These had cylinders of 8 to 10 feet diameter, like a working pump barrel; the valves were made in various ways, and were fitted with counterpoise weights, having fulcra on the piston-rod, by which means the valves opened more easily and with less pressure. At the base of the cylinder in which the piston worked is a clack valve of a similar character. The machine worked in the same manner as the last one, but instead of using water the friction of the piston against the sides of the cylinder came into play.

Fig. 38



Something like 30 years ago Mr. Struve proposed to improve on this plan, and erected several ventilators at collieries in South Wales. A sort of a sheet-iron bell, like a gasometer worked within an annular interior space constructed of brickwork, which contained water, as in the air-pump first described, for the purpose of securing a water-tight joint. The air-shaft ran up one side of the bell, and a system of valves were arranged on both sides, those on the side of air-shaft opening inward, those on the other side outward. The arrangement was such that both in the upward and downward movement of the bell the foul air was admitted into one part of the apparatus, while that previously taken in was driven out from another part. [Illustrations of this and other ventilators to be subsequently mentioned were given in Prof. Smyth's Coal and Coal Mining.] At first these machines were put up 14 or 15 feet diameter, afterwards as much as 24 feet, and they are generally so arranged that one engine worked two such pumps. They are theoretically capable of drawing a very large volume of air, and have practically done very satisfactory work; but objections have been raised, as for example, on the score of expense consequent upon the variety of construction needed, and the flap-valves being of such a nature as to give rise to a great deal of trouble. Altogether the machine does not seem to have spread from Wales. The lecturer had seen the Belgian variety described above at work at the Mont Cenis Tunnel, drawing the air from a gallery under the workings, and they were there very highly spoken of. The Belgians were also in advance with respect to the introduction of horizontal cylinders, and as long ago as 1828 M. Brisco erected a small machine near Charleroi, but this was carried out on a larger scale and improved by M. Mahaux in 1856. The principle of the latter machine is briefly this: a horizontal steam cylinder works directly, by the means of a piston-rod from each end, a large piston in each of two horizontal air cylinders. The cylinders also contain a diaphragm, with valves opening towards the piston, and the piston likewise has valves opening outwards. The air to be pumped out is admitted behind the diaphragm, and passes through the valves of the diaphragm as the piston retreats; on the return stroke of the piston it escapes through the valves of the piston. This apparatus has not been in use in many mines, but was put up at one of the Belgian mines on such a scale as to circulate a volume of 45,000 cubic feet per minute, the piston being 4·5 meters diameter. Mr. Nixon at some of the South Wales collieries, especially at the Navigation pit, near Aberdare, erected apparatus somewhat similar, but it was on a much larger scale, and the action was double. The chamber in which the piston worked was 30 feet by 22 feet, and the area of the piston was similarly 660 square feet, the length of stroke being comparatively small—7 feet. The piston, which weighed 13 tons, was built of boiler plate, and was supported and moved on two pairs of wheels, running on rails. A series of flap valves (672 in all), each 16 inches by 24 inches, were connected with the apparatus, and when open reduced the chamber, in fact, to a mere skeleton or framework. Two lower sets of valves opening inwards communicated with the offtake, bringing the return air from the shaft; two upper series opening outwards gave exit to the expelled air. The engine which worked this air piston by means of a crank, had a cylinder 36 inches diameter, and a stroke of 6 feet, and used high pressure steam, the number of strokes was 9 per minute, giving a theoretical volume of 166,320 cubic feet, while it could be if occasion required increased to 12 strokes, making the volume upwards 200,000; allowance would have to be made for the leakage. The lecturer was struck to see how, even with such a large machine, a ventilating furnace in the return air course drew the air away from the machine to a much greater extent than would be imagined. Furthermore, there is an objection, owing to the great expense, and the lecturer was not aware that it had been adopted elsewhere; nevertheless it remains a mark of great enterprise and ingenuity.

FANS.

We may now leave the air-pumps, and consider some machines in which it is endeavored to effect the ventilation by the rotation of a fan. This is a very old process, yet it continued to be employed on a very small scale only till quite recently. In our metalliferous mines the fans are very constantly used, worked by a boy or a man, or it may be by a water-wheel, seldom exceeding 2 or 3 feet diameter, and driving air through a pipe 4 to 6 inches diameter. Some 30 or 40 years ago experiments were tried at several collieries on the use of these fans on a larger scale by Mr. N. Wood and others, but they were all put down as failures. One reason for this was undoubtedly that in many of the fans tried, especially if of large size, they were put in rapid rotation, and struck the air, so as to bring it up to a high degree of velocity, and then driving it out through a narrow tube, the velocity was greatly checked. The laws of movement of an elastic medium like that of air shows us that the resistance is enormously increased out of all proportion when it is thrown into a high degree of velocity, and in these experiments, therefore, a very great deal of the power was absolutely lost. About 30 or 40 years ago two or three mechanicians and coal viewers began to think of employing some different kind of fan. Before this, however, the French and Belgians had made experiments, and had come to the conclusion that a fan with a certain construction of curved vanes could be used much more advantageously than one with straight radial vanes. Mr. Brunton, an Englishman, proposed one about the same time, where the fan was placed at the top of the shaft on a suitable framework, and being put in rapid rotation the air was admitted into the center, and thrown out at the exterior by a series of curved vanes. In this case it was rendered somewhat difficult of application, on account of the great leakage between the fan and the lip of the shaft, there being a strong tendency for the air to pass through this part to replace that drawn from the shaft. It was endeavored to prevent this by having a rim of iron dipping into water, but probably if rapid revolution were required the water would be thrown out. Several different kinds of fans were proposed, and erected, by Mr. Nasmyth, where the fan was placed vertically (not horizontally, as in the last instance), but had simple radial vanes. This construction would make a fan 12 feet to 16 feet diameter, but the lecturer did not think they could be regarded by any means as a success, either as to quantity of air circulated or economy. At the Great Exhibition of 1862 M. Guibal, a Belgian engineer, exhibited some carefully prepared mechanical drawings of a fan intended to be 28 feet diameter and 12 feet across, which he proposed should make 40 to 50 revolutions per minute, and from careful experiments he asserted that 74 per cent. of useful work could be obtained. The lecturer had had the opportunity of examining these drawings along with some experienced North of England viewers, and they would not believe that the thing could possibly be done, notwithstanding that it had been practically applied in Belgium, but the strange fact is that at the present time it is not overstating the matter to say there are not less than 100 of these machines, of large size, too, in use in this country. A circular case of wood or brickwork incloses the fan, communicating on one side with a trumpet-shaped small shaft for the exit of the air, the air from the mine being admitted at the center of the fan. The paddles are interlaced in such a manner as to give a strong frame, and in front of the exit aperture is a curved apron, or door, which can be moved up or down, so as to regulate the size of the aperture. Some of these in the northern districts are 36 feet diameter and 12 feet wide, and a few have been put up as much as 45 or 46 feet diameter and 12 to 14 feet wide. The movable apron is adjusted till the position of greatest efficiency is found. The trumpet-shaped exit shaft is said to be advantageous as counteracting the evil effects of the great velocity given to the air, enabling it to expand, and therefore, to issue more readily. It is usually preferred to have two engines fitted to these machines, so that should anything go wrong with one the dangers of stopping the ventilation may not be incurred. Other fans have been introduced in Belgium, very similar to some brought forward by Mr. Waddell in England; these are of a simple character, a vertical fan revolving in front of a brick wall, and air being admitted to the center of the fan through an opening in the wall opposite the center. The fan was constructed of sheet-iron, and made 60 to 80 revolutions per minute. The difficulty was at first felt of the leakage of the air between the fan and the wall, but was got over to a very great extent by making the face of the wall in that part of cement, which was very carefully smoothed, so that the fan could run very close to the surface. Among the machines constructed on the principle of varying capacity must be mentioned that of Mr. Lemielle. On this you have an outer drum or case, and inside an inner drum, circular, hexagonal, etc., but placed eccentrically; the valves are attached to this, and also to rods, which are attached to the point in the center of a large outer drum. This acts as in the feathering paddle-wheel, the vanes or valves being opened out in one part of the revolution, and drawn close to the sides of drum in another. Another kind of wheel has been employed with great success in the North of France and in Belgium, invented by M. Fabry, and the lecturer believed it would become capable of doing more work and be more popular had the inventor pushed it more. The machine has two wheels, each having three arms, and each of these arms again having a cross-piece, each having along its extremity a curvilinear piece of iron, which come into close approximation during the revolution, and so prevent leakage, except to a very small extent; at the same time other vanes are sweeping out the air rising from the pit. The lecturer had seen one in the South of France, which had been in use for 20 years, and upon the work of which they passed a very high eulogium, and attributed the success in great part to the fact that there were no joints in it.—*London Mining Journal.*

MECHANICAL TREATMENT OF METALS.

Prof. R. A. Thurston gives, in the *Metallurgical Review* for September and October, an interesting article upon this subject. We epitomize:

1. *Qualities Affected by Mechanical Treatment.*—The defects of metals are often removable by proper mechanical treatment, and the methods practiced for this purpose involve directly or indirectly the elevation of the original elastic limit of the material, usually producing a change in all the physical properties of the metal.

Defects removable by mechanical treatment may be properly classed as defects involving want of homogeneousness. Metals may be homogeneous in two ways: (1) homogeneous in structure, such as blow-holes, particles of slag, etc. (2) homogeneous as to strain, *i. e.*, it may be free from inherent strains, due to badly designed castings, etc.

Defect of homogeneousness of structure may be removed more or less completely, at temperatures below the fusing point, by special methods adapted to use as the given temperature. Blow-holes in metals can be condensed, excluded

or expelled either by compression or by the use of some material in the form of a flux to prevent the development or the absorption of the gas by forming a slag of it which may be skimmed from the metal.

2. *Fluxing.*—Illustrated in the use of Si and of Mn, to confer soundness to ingots in the cast steel processes, and by the use of P to insure soundness in Cu and Sn and Cu and Zn alloys, which metals are made defective by absorption of O and formation of oxide; bronzes especially being liable to this defect.

3. *The Whitworth Process.*—Embracing the mechanical treatment of metals at the point of fusion by hydraulic pressure. The gas in ingots or castings occasioning blow-holes, are often removed by the addition of Mn in the form of a carbide. This necessitates the introduction also of carbon at the same time, which, in the manufacture of mild steels, is objectionable. Si possesses the same property as Mn, but in a higher degree, one two-hundredths of one per cent. reducing the liability to such porosity very greatly.

At Terrenoire, France, the double silicide of Fe and Mn is added to the molten metal as a carburizer instead of spiegel.

Whitworth secures the desired density in cast steels by subjecting them in a fluid state to a very heavy hydraulic pressure until completely solidified. A pressure of 20 tons to the square inch produces the desired compactness, density, strength and ductility. By this method Whitworth has produced steels of tenacities varying in the several grades from 80,000 lb. per square inch to 150,000, and of ductility from 35 per cent. in the softer metal to 14 per cent. in the strongest grade. According to Whitworth, a column of fluid steel while solidifying under pressure, shortens an inch and a half to each foot of its length, which gives an idea of the unsoundness of the best ordinary castings. The change of texture, due to compression, is very marked. The molten steel must be put under pressure before solidification commences.

4. *The Lavroff Process.*—Bronze and brass may be heated by the same methods, with no less important gain in excellence of quality.

5. *Rolling and Forging.*—All metals are found to gain strength with hammering and rolling. The strength of a grade of iron with a tenacity 50,000 lb. per square inch section, when made into bars 2 inches in diameter, becomes gradually increased as the size of the bar is reduced by rolling, until a 1 inch bar of the same iron shows a tenacity of 60,000 lb. to the square inch. Cu and some of the alloys may be similarly improved by heating to a moderately high temperature and drawing out under a hammer or a rolling mill. Cast copper with a tenacity of 20,000 lb. may acquire in this way a strength of 40,000 lb. and upward.

6. *Hydraulic Forging and Drop Forging.*—This process is not always effective. The best of all methods of securing thorough condensation in the process of forging small pieces which can be so treated, is that in which the hydraulic press, with its slow action producing an effect felt throughout the entire volume of the piece, is employed.

7. *Thermo-Tension and Annealing.*—Defects of homogeneousness of structure may be thus removed partially or wholly by several known processes of treatment of heated metal. Defect of homogeneousness of strain is removable from iron, and perhaps other metals, by annealing, and by Prof. Walker Johnson's method of thermo-tension. The metal heated to a fine red heat (avoiding welding heat) is subjected to a tensile stress of as great an intensity as is safe, the stress being retained till the metal is cold.

8. *Cold Working.*—Methods of treatment may be divided into two classes: (1) those applied for the purpose of conferring greater density. (2) those which are adopted for the purpose of modifying the character of the metal in respect to internal strains. Such processes are wire drawing, cold hammering and cold rolling.

9. *Wire Drawing.*—With decreasing diameter the tenacity increases, becoming very great when the wire is drawn very fine. Where a wire is made of good refined charcoal iron, its tenacity may be approximately estimated by the formula:

$$T = \frac{50,000}{4\sqrt{D}} \quad \ldots\ldots (1)$$

$$T' = \frac{70}{4\sqrt{D}} \quad \ldots\ldots (2)$$

1 giving the tenacity per square inch in pounds, and 2 the tenacity per square millimeter in kilos, the diameter being taken in inches or millimeters respectively. N being the number of the wire by the Birmingham gauge, a fair value of tenacity will be—

$$T = 50,000\ {}^{8}\sqrt{N} + 20,000 \quad \ldots\ldots (3)$$

$$T' = 35\ {}^{8}\sqrt{N} + 14 \quad \ldots\ldots (4)$$

Brass, and probably all other metals and alloys which have the requisite qualities to permit them, being worked by this process, are similarly increased in tenacity by the action of the draw-plate.

10. *Cold Rolling.*—The Lauth process has been adopted to give increased stiffness and elasticity to iron, steel, and other metals. The precise temperature at which this effect can be produced has not been determined. The range, however, extends nearly, if not quite, to a full red heat.

Fairbairn found this process to increase the strength of one-inch bars from 60,746 lb. per square inch to 88,230 lb. The extensibility was reduced from 22 to 8 per cent. Chief Engineer J. P. Whipple, U.S.N., found sheet iron thus heated to have its tenacity increased by from 60 to nearly 100 per cent., attaining in one case a tenacity of over 100,000 lb. per square inch, and in others from 112,000 to 114,555 lb.

Major Wade found the resistance to forces producing deflections of 0·1 inch in bars of from 1½ to 2 inches in diameter, with supports 30 inches apart, being respectively about 3,000 and 13,000 lb.

He found the resistance to torsion increased 130 per cent.; the increase in resistance to compression was 160 per cent.; in tension from 70 to 95 per cent.; and the hardness was increased 50 per cent.

The effect on steel is similar to that produced in iron. F. G.

TO BE CONTINUED.

NORTH SHORE OF LAKE SUPERIOR.

Special Correspondence of the Engineering and Mining Journal.

During the summer mining has been very quiet in this district—Silver Islet and the Duncan mine are the only ones where any work is being done.

At Silver Islet they are exploring with the diamond drill on Bumb Island, but to last accounts without important results. From the upper part of the mine they have taken out lately about two tons of 2,000 ounce ore, with more to come, as the work on the artificial roof progresses. Many doubts have been expressed about the feasibility of this project, but where the stake is so great, making expense no object, and if the work is properly done, as it is likely to be, I see no reason why it should not be a complete success.

At the Duncan mine exploration with the diamond drill has been continued during the summer, and about 1,000 feet of holes have been drilled in different directions without any new developments of silver, except on the surface, where the drill passed through some native silver. This ground is now being opened to find the extent of this deposit.

The drill is now at the bottom of the deep shaft, where the work had been temporarily stopped to make more room for the drill. At the deepest point, 700 feet below the surface, although not on the main vein, the leader's met had more favorable appearing gangue than seen for some time. It will take 1,300 feet more of holes to completely decide that the vein is valueless.

IMPORTANT GOLD DISCOVERY.

By far the most important discovery of the season has been made about one hundred miles up the line of the Canada Pacific Railroad, now being constructed from this place.

A party brought down some rich gold quartz and a three pound nugget, which they supposed might be gold, but did not feel certain until they had the opinion of an expert.

Without letting any one into the secret, they have returned to prospect a little for veins and more nuggets, before taking a surveyor to locate their lands. On their return we shall know whether this is the usual Autumnal "sell" to let a few "dead beats" get safely out of the country, or a valuable discovery, as all believe it who have the best means of knowing and are most reliable.

If the gold proves to be in quantity, it will cause quite a prospecting excitement here next spring, as valuable gold bearing veins have already been located at the Height of Land, very promising in surface appearance, but which have never been developed, owing either to want of capital or party disputes.

These veins carry copper pyrites, free gold, some silver, and tellurides, and assay from $10 per ton to many hundreds. The average of specimens would give three to five per cent of copper. As soon as the railroad is completed thus far, these mines will prove of great value without doubt. EZUEST.

PETROLEUM NOTES.

PRODUCTION, STOCKS, SHIPMENTS, ETC., OF THE PENNSYLVANIA OIL FIELDS, BY DISTRICTS, FOR SEPTEMBER, IN BARRELS OF 42 GALLONS.

Number and Name of Districts.	PRODUCTION ACCOUNT. No. bbls. of oil on hand at the wells at the close of the month.	No. of bbls. of oil produced in the month.	Average per day for the month of 30 days.	No. of bbls. of oil in iron tanks, pipe lines and refineries.	Total No. of bbls. of oil held in all the districts.	DRILLING WELL ACCOUNT. No. of wells producing.	No. of wells drilling.	No. of wells completed in September.	Aggregate daily production of new wells.	Daily average of new wells.	No. of Rigs building.	Dry holes in Sept.
Butler ..... } Parker ..... } Clarion ..... }	80,000	736,800	24,560	1,876,041	1,956,041	4,150	290	152	3,209	20	197	28
Scrubgrass....	3,500	165,000	5,500	8,000	11,500	250	32	30	450	15	20	8
Franklin.....	500	12,000	400	20,000	20,500	360	11	16	100	6¼	14	6
Reno	.....	3,000	100	8,000	8,000	31	.....	.....	.....	.....	.....	.....
Oil City.....	1,000	25,500	850	195,300	196,300	360	4	6	33	5½	5	2
Rouseville ...	400	12,000	400	8,000	8,400	200	2	7	50	7	3	2
Rynd Farm...	450	12,000	400	5,615	6,065	125	2	2	13	6½	.....	.....
Columbia.....	4,179	3,900	130	4,000	8,179	31	.....	.....	.....	.....	.....	.....
Petroleum Cr.	400	3,000	100	15,000	15,400	50	.....	.....	.....	.....	.....	.....
Shamburg	400	6,000	200	8,000	8,400	96	2	2	12	6	4	.....
Titusville.....	1,533	45,000	1,500	62,893	64,426	750	15	12	84	7	12	5
Pithole.....	400	6,000	200	9,836	10,236	78	1	1	6	4	.....	.....
Fagundas.....	2,500	6,000	200	14,000	16,500	150	1	.....	.....	.....	.....	.....
Tidioute.....	4,000	12,900	430	40,000	44,000	242	2	2	10	5	.....	.....
Warren.....	1,000	13,080	436	19,685	20,685	112	7	6	38	6½	8	3
Bradford.....	8,000	148,230	4,941	99,458	107,458	750	156	83	1,000	12	58	5
Beaver.....	500	4,300	150	667	1,167	137	10	3	6	2	5	1
Totals	109,162	1,214,910	40,497	2,394,495	2,503,657	7,872	535	322	5,011	15⅝	426	60
Total for Sept.	109,162	1,373,759	41,089	2,743,382	2,852,544	7,684	417	255	4,695	18¼	338	48

—*Petroleum Reporter.*

PROJECTED PIPE LINE TO THE OHIO RIVER.—The oil producers of the Butler region are negotiating for the right of way for a pipe line to the Ohio river, where it is understood a large refinery will be built about two miles east of Freedom. The line will be twenty-two miles long.

THE PAST AND PRESENT PRODUCTION OF PETROLEUM ON OIL CREEK, PA.—A recent number of the *Titusville (Pa.) Herald* in a resume of the petroleum development remarks: "After striking of the Drake well, August 28, 1859, Oil Creek from Titusville to its mouth comprised forty-five producing farms, was rapidly seized upon by speculators, and in the space of three years the valley became a forest of derricks. In 1863 the derricks on the creek numbered upwards of two thousand, and the average cost of each well was a little over $4,000, making a total expenditure for machinery and labor of $8,000,000 to $10,000,000, exclusive of the prices paid for farms or the royalty. In 1865 five of the farms produced 16,000 barrels daily, but now yield only 140 barrels, while the entire production of Oil Creek at present does not exceed 2,300 barrels per day. The average price of oil was reduced from $20 per barrel, in 1859, to $9.60 in 1860, and in 1861, owing to increased production, it declined to ten cents a gallon, continuing at that figure until February, 1862, when it rose to twenty-two cents. From this time on better prices prevailed, and in July, 1864, it reached $13.50 per barrel, but in the following year the average price was $6.13, and at no time since then has it reached that figure."

NEW DISCOVERIES AND THE RAPID DEVELOPMENTS IN THE PENNSYLVANIA OIL REGION.—C. Henry Rodney, C. E., in a letter to the Philadelphia *Press*, dated the 8th inst., from Corry, Pa., says:

"Wells are now being sunk in search of oil in Elk, Clinton, Cameron, Tioga, Bradford, and Westmoreland counties. The 'Bradford region,' near the town of that name, in the northern part of McKean county, is more extensive than at first supposed. The wells are about 700 to 900 feet in depth, and yield about 100 barrels each per day when first sunk, their aggregate production now being more than one-tenth that of the entire State.

"In Elk county one is down 600 feet without as yet giving any show of oil, but about five miles north of Wilcox, another one, down 2,000 feet, with a set of boring tools lost in it, is an intermittent flowing well. It is quiescent for eight minutes, then suddenly spouts salt water and gas, with a small quantity of oil, to a height of 150 feet for two minutes. At night the gas is lighted for the amusement of visitors, and is a magnificent sight, the water assuming all the colors of the rainbow, and the gas burning with an intense glare and with a noise which can be heard for miles.

"At Mansfield, in Tioga county, a well is down 1,200 feet, and another, at Elkland, in the same county, 700 feet, but without as yet a satisfactory show.

"In Cameron county preparations are being made to start three wells at Emporium, one at Portage, and another on the Sinnemahoning. One near Emporium has already reached a depth of 600 feet.

"Six miles east of Renovo, on Hyner's Run, in Clinton county, about three weeks since, a well was commenced, and is now down 880 feet in red sandstone rock. Salt water was struck at a depth of 185 feet. At 420 feet a vein of gas was struck, which, on, being ignited, blazed up to a height of twenty or thirty feet, threatening the destruction of the derrick, but with some difficulty the flame was extinguished and drilling resumed. By rail Hyner's Run is forty-one miles east of Williamsport and twenty-one miles west of Lock Haven, so in case it yields no oil, if the volume of gas is sufficient, it might be conducted to those points.

"One of the latest oil discoveries is at the mouth of Chartiers Creek, Westmoreland county, on the Alleghany Valley Railroad, 22 miles north of Pittsburg. Another well on Beaver Run, in the same county, is down 300 feet, with a good show in the second sand rock; they expect to strike oil at less than one thousand feet from the surface. Another well has just struck at Edenburg, Clarion county, *between* the supposed eastern and western belts, and is yielding 600 barrels per day. This well is near the Helen furnace, eight miles northeast of the town of Clarion, and some ten miles distant from the large producing section of that country. It is situated exactly on the 45th degree line from Edenburg, and has long been looked upon as possible oil territory, though no previous attempts at development have been made. Another well is being sunk on exactly the same line some ten miles beyond this—or twenty-two miles from the Edenburg district.

"Oil has since been struck in the well on Hyner's Run at a depth of 1,015 feet. There is much excitement in Lock Haven, where the new well is owned, and preparations are being made to put several more wells down in the same vicinity at once. This is the most easterly point on the Sinnemahoning at which oil is found."

THE SYSTEM EMPLOYED IN DRILLING FOR OIL.—The same correspondent observes: "The system of drilling now in vogue is a great improvement on that pursued a dozen years ago in the use of 'casing' to shut off the surface water. The surface wells, 300 or 400 feet deep, put down from 1861 to 1864, were drilled about two and one-half inches diameter, with a set of tools weighing about 300 pounds, attached to a "spring pole" with a derrick about 25 or 30 feet high, operated by two men, the spring pole being something like the pole of an old-fashioned well, and 15 or 20 feet per day was considered rapid progress. As the weight of the tools, the diameter and depth of the well was increased, horse-power, and afterwards steam power, was substituted for the 'spring-pole.' With the present system a derrick of 65 to 75 feet height is first put up; steel-edged cast-iron driving pipe eight inches internal diameter is then driven through the surface soil until it rests on solid rock; then a hole eight inches diameter is drilled with tools weighing about 2,000 pounds to a depth below the surface varying from 150 to 500 or more feet, when a 'casing' of light iron pipe six inches internal diameter, is lowered down and rested in the rock, and the holes continued down five and one-half inches diameter, until oil is struck or a depth usually sufficient to reach it in that region has been attained. When the well is tubed and pumped for a reasonable length of time, if no oil is yielded, some torpedoes are exploded in it in order to open up communication with crevices containing oil, if possible, and if no oil is then obtained it is abandoned. Sometimes the elastic force of the confined gas is so great that upon striking the crevice containing it it forces the tools out, and the oil commences to flow without pumping; at other times pumping may be required for a few days or continuously. With the heavy tools now in use 70 feet per day is sometimes averaged. In the old method of boring without casing the hole was kept full of water, which followed the drill down, exerting a pressure of over 300 pounds per square inch at a depth of 700 feet, which the gas must overcome before the oil would flow spontaneously, and in many cases is supposed to have driven the oil into other channels before the pump was put in, sometimes even flooding another well at some distance which had been yielding oil. By using 'casing' these risks are prevented, as the surface water is prevented from reaching deeper portions of the well. As the tubing and casing are withdrawn from abandoned wells they should be required to be plugged below the surface water-veins, otherwise the producing wells of the district will sooner or later be ruined by being flooded with surface water or the escape of gas.

THE FLOW OF NATURAL GAS, ITS UTILIZATION AND IMPORTANCE.—The same correspondent says: "The increasing use of the gas which escapes in enormous quantities from many of the wells sunk for oil, is attracting much attention for lighting and heating manufacturing purposes. At some of the wells it has been used for years in place of coal for getting up steam, being conducted into the fire-box of the boiler and ignited. At others, where the pressure is sufficient, it is sent into the cylinder of the engine in place of steam, the pressure sometimes being as high as 1,000 pounds per square inch. Some of the wells yield an enormous quantity of gas of high illuminating quality for years, sometimes being sufficient for lighting and heating purposes for whole towns, while at others the gas is allowed to escape, and being ignited, gives a brilliant flame, which illuminates the country for miles. At Sheffield, Warren county, Pa., there is a well a few feet south of the railroad track, 900 feet deep, bored two and a half years ago, and which yields two to three millions cubic feet of gas every twenty-four hours, a portion of which is used for illuminating and heating the town, the rest being allowed to burn at the well. The gas from some of the wells 1,000 deep, and thirty miles above Pittsburg, is conducted to furnaces near that city, and used in puddling iron at very much less cost than coal. It has one great advantage, its entire freedom from sulphur and phosphorus, being nothing but hydrogen and carbon. There are now about fifteen gas wells in use in the city of Erie, Pennsylvania, for manufacturing, lighting, heating, and cooking purposes. Their depth is about 700 or 800 feet, and the cost of drilling and tubing them about $1.50 per foot. The gas from those which I examined, apparently, has higher illuminating power than ordinary coal gas, and gives the best results with an argand burner and chimney. It seems perfectly practicable to extend pipe lines to our large continguous cities for the purpose of conveying and utilizing this gas in place of allowing it to escape as it does at present, and I have no doubt it will ultimately be done."

THE PRODUCTION, EXPORT AND AVERAGE PRICE OF PETROLEUM FOR THE LAST 18 YEARS is given in the following table:

Years.	Production. barrels.	Exports. gallons.	Average price at the well per barrel.
1859.....	2,000	.....	$20 00
1860.....	500,000	.....	9 60
1861.....	2,113,609	1,500,000	30
1862.....	3,056,690	10,887,801	1 15
1863.....	2,611,309	28,250,721	3 25
1864.....	2,116,109	31,872,724	7 62
1865.....	2,497,702	29,805,523	6 18
1866.....	3,597,702	67,430,451	3 78
1867.....	3,347,300	67,052,029	2 54
1868.....	3,646,117	99,281,750	3 95
1869.....	4,215,000	102,748,604	5 48
1870.....	5,260,745	141,208,155	3 74
1871.....	5,205,341	156,514,735	4 50
1872.....	5,939,003	150,162,419	3 84
1873.....	9,890,964	237,481,633	1 84
1874.....	10,950,730	233,143,151	1 29
1875.....	8,787,506	232,411,817	1 48
1876.....	8,968,906	314,900,952	2 15

THE TRANSPORTATION OF PETROLEUM IN VESSELS.—The *Kingston British Whig* of the 5th inst. says: "An oil tank vessel designed for the oil trade between Sarnia and Montreal, has just been completed. Some 85,000 lb. or 42 tons of iron have been consumed, and the tanks, of which there are six, three on each side, will carry about 400 tons of oil. It is the intention, we believe, to have two more tanks made to lie on the deck of the schooner to make her deep enough to sail down the lake. These will be lightened here. The capacity of the six tanks will be nearly 114,000 gallons, and the total when full loaded about 150,000 gallons.

AN OIL BARREL COMBINATION.—Twenty leading manufacturers of oil barrels met at Pittsburg on the 22d inst. and unanimously resolved to charge one dollar forty cents per barrel. The increase is due to a strike of the journeymen for an advance of 40 per cent. It appears that the Standard Oil Company is trying to "break the market," by bringing barrels from "outside points," but the manufacturers have determined to close their shops, with the expectation that when the supply is exhausted the Standard Company will agree to pay the market price.

At the United States Tin Plate and Iron Works, near McKeesport, recently a vein of natural gas was struck a few feet from the surface of the earth. A well is to be sunk, and if a sufficient supply for use as fuel can be obtained, the use of coal will be abandoned in favor of the cheaper fuel.

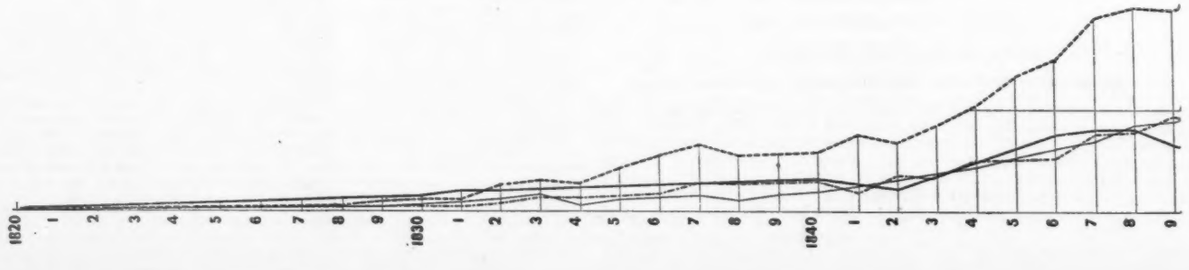
OLEAN, BRADFORD & WARREN R. R.—This company has recently been organized to build a narrow gauge road from Bradford, Pa., on the Bradford branch of the Erie, to Gillmor City, or Foster Brook, in the New Bradford oil region.

REFERENCES.

———————— *Annual production of Anthracite Coal in the Lehigh Region.*
———————— " " " " " " " *Schuylkill* "
———————— " " " " " " " *Wyoming* "
———————— " " " *Pig Iron in the United States.*
———————— " " " *Anthracite Pig Iron.*
———————— " " " *Bituminous* " "
———————— " " " *Charcoal* " "
———————— " " " *Petroleum in Pennsylvania.*

Use the same scale for Petroleum calling Tons Barrels.

The data for the Oil were obtained from J. F. Carl, Geologist, Pleasantville, Venango County, Pa.
" " " " *Coal* " " " *the Engineering and Mining Journal, New York.*
" " " " *Iron* " " " " *Bulletin of the American Iron and Steel Association, Phila.*



THE PETROLIA, ONTARIO, OIL MARKET.—The Petrolia *Advertiser* of October 12th says: "The market has been somewhat excited during the week, owing to the very general opinion entertained that the Standard Company had purchased the Empire and Conduit Companies, with a view to the almost immediate raising of the price of refined. So confident are many of the more influential producers here, that but few with spare working capital care to accept present prices. The demand for crude is not excessive, owing to the withdrawal of one or two of the larger buyers, who have sold forward in refined, and now use their influence to *bear* the crude market. Nevertheless, in the face of this, which has been going on for weeks, it has almost steadily advanced from $1.10 to $1.40 for quantities offered by the Crude Oil and Tanking Company. The chances are that we shall have at least a spurt of 'export' this season, in which case every barrel of crude oil should be forthwith worth say $2 per barrel. Our refined markets are not glutted, although an enormous lot of futures are sold; on the contrary, much must continue to be sold during each of the next six months. A silent war has been waged between the London refiners and producers here, who each struggle to cut each other's throat, for the benefit of the public they so much abused last year. Our stocks of crude are lighter by far than at any time for the past five years, and tanking is going a-begging. In this district there are 503 pumping wells, 14 drilling, and some 8 repairing, with a daily production of 1,614 barrels. The shipments of oil from Petrolia Station, Ontario, Canada, for this year up to date, were 224,541 barrels of crude, 50,561 distilled, and 7,821 barrels of refined."

OIL DISCOVERY IN COLORADO.—The latest discovery in San Juan is that of petroleum, on a little stream about twenty miles east of Pagosa Spring.

DISCOVERY OF PETROLEUM IN NEW YORK.—A new oil territory has recently been discovered in New York State, on what is called Mud Creek, near its confluence with the Conewango.

FOUR miles from Kennedy, in Chautauqua County, N. Y., oil has been struck, at a depth of 900 feet.

PROSPECTING FOR OIL IN CHINA.—Mr. Karns, of Titusville, started recently for China, where the government has employed him to prospect for oil. He is to get a salary of $3,000 and expenses for the first year.

THE NEW YORK PETROLEUM MARKET.—The *Shipping List* of October 23d says:
CRUDE—Remains quiet at 8½ cents bulk and 11¼ @ 11½ barrels, without sales.
REFINED—Has been dull, and for the most part nominal, although the market yesterday was a shade firmer. The sales are 7,500 barrels spot and early delivery at 14¼ @ 14½ cents; 12,500 do. for November, 14⅜ @ 14½; and 2,500 do. in Baltimore, 14⅜. Cases are quiet at 17¼ @ 19 cents; the market closing at 14½ here, and 14⅜ in Baltimore and Philadelphia.
NAPHTHA—Remains quiet at 7 @ 8 cents, with transactions reported of 2,200 barrels within the range.
RESIDUUM—Is still dull and nominal at 6½ @ 7 cents, without sales.
CERTIFICATES—Have been rather more steady; 70,000 barrels United have changed hands within the range of $2.08⅜ @ $2.15 regular, and $2.15 next week. Oil City quiet and firm: United, $2.15⅝ bid, $2.16 asked. Parker's $2.15 bid, $2.15⅝ asked.

CHARTERS—The charters include 13,500 barrels refined, 16,800 cases do., 2,200 barrels naphtha. From Philadelphia, 16,000 cases refined. From Baltimore, 3,500 barrels refined, 4,600 do. crude.

EXPORTS OF REFINED PETROLEUM.

	1877.	1876.
Since our last.....gallons	2,039,208	....
Previously since January 1 "	194,322,012	113,752,520
From other ports..... "	79,196,373	90,936,200
Total.....gallons	275,557,593	204,688,720

The members of the Petroleum Exchange held a meeting recently, for the purpose of voting upon the proposed amendments to the by-laws, providing for an increase in the number of active members, heretofore limited to 50. The vote cast was unanimously in favor of issuing certificates of membership, at $100 each, upon written application, which must be approved by a two-thirds vote of the Board of Directors.

THE MONONGAHELA STRIKE.—The strike of the coal miners up the Monongahela is practically ended. Most of the works in the first, second and third pools resumed operations on the 10th inst., and the prospects are that all the men will be at work soon. They get the advance of three cents a bushel, bnt abandoned the demand for pay every two weeks.

CHART SHOWING THE PRODUCTION OF ANTHRACITE COAL IN THE LEHIGH SCHUYLKILL, AND WYOMING REGIONS; ANTHRACITE, BITUMINOUS, AND CHARCOAL PIG IRON IN THE UNITED STATES, AND PETROLEUM IN PENNSYLVANIA, FROM 1820 TO 1876.*

By John Henry Harden, University of Pennsylvania, West Philadelphia.

It appears that in the earlier days of anthracite coal mining, 1824–25, the Lehigh region mined 76 per cent. of all the coal sent to market. During the same period Wyoming sent 12 and 5 per cent. respectively, whilst the Schuylkill sent 11 and 18 per cent., the number of tons marketed being in those days very small indeed.

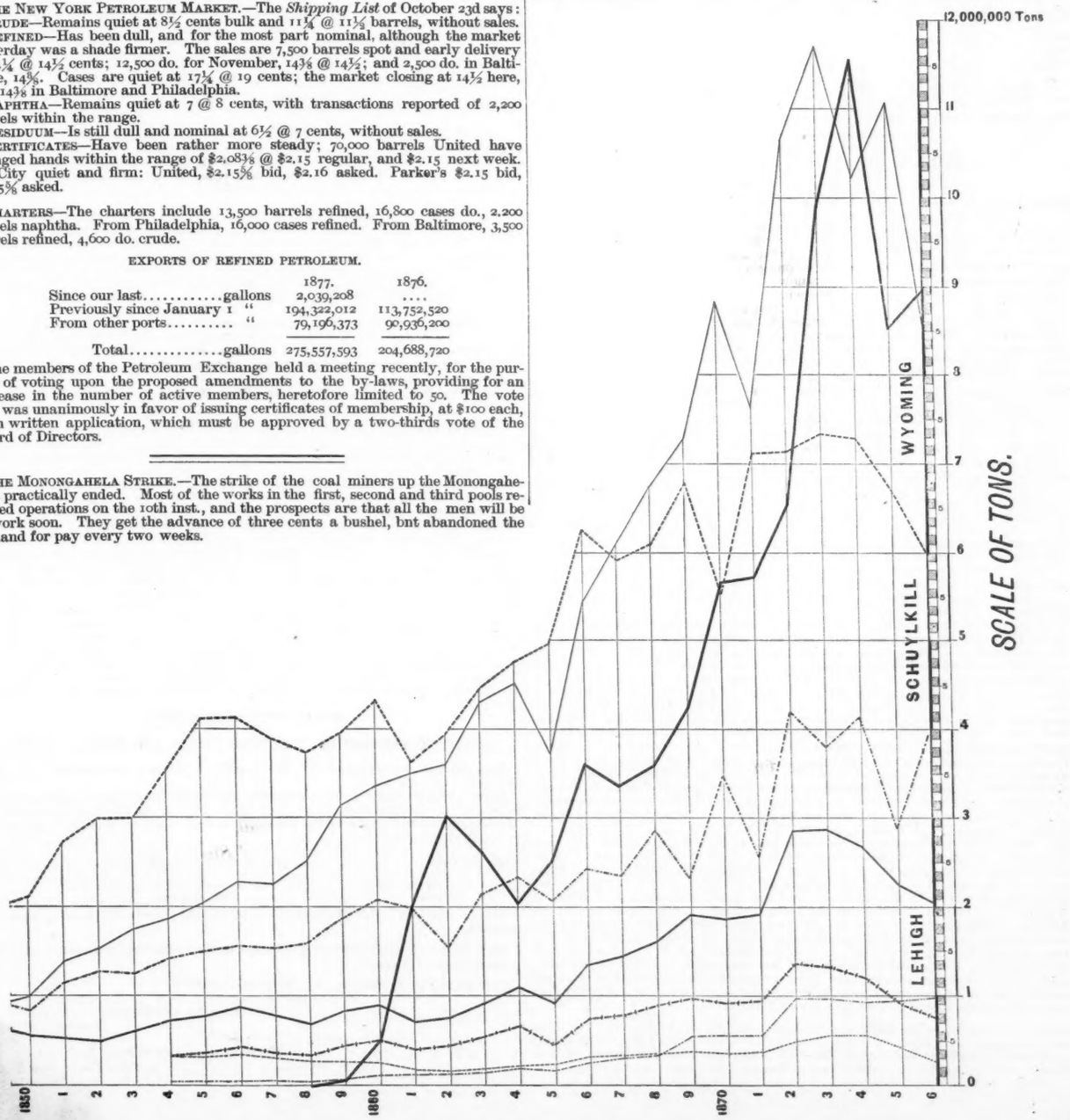
In the year 1828 the Schuylkill region mined over one-half of all the coal sent to market, and continued to do so for thirty years (with the exception of the year 1831) until 1858; since that date the production has declined very steadily in comparison with the other regions, until, in 1876, it was only 34 per cent.

Wyoming, in the year 1820, was mining 40 per cent., but the production of all the regions was very small; in six years it declined to 5 per cent., increased to 34 per cent. in 1831, declined to 10 per cent. in 1838. Since which time the increase has been gradual, until 1873–75 Wyoming produced over 50 per cent. of all the anthracite coal sent to market. In 1867 the production exceeded that of Schuylkill, and has continued to do so since that time.

In the year 1876, during the existence of the "coal combination," Wyoming lost 9 per cent.; during the same time Lehigh gained 7 and Schuylkill 2 per cent. over their relative production of the preceding year, the decrease of Wyoming being two and half million tons, the increase of the Lehigh one million, the decrease of the Schuylkill nearly three quarters of a million.

The extraordinary production of the Lehigh region at a time of decreased de-

* A paper read before the American Institute of Mining Engineers, at the New York meeting, February, 1877.



mand and in opposition to an agreement with the other regions to limit the supply to the supposed demand, was the cause of the disagreement which ultimately broke up the combination of the great coal producing and carrying companies.

The Lehigh region produced very steadily from 1829 to 1854, an average of about 22 per cent. of the whole production. From 1854 to 1875 the average has been about 18 per cent., showing very plainly that the production of the Lehigh has not kept pace with Schuylkill or Wyoming.

COMPARATIVE PRODUCTION OF ANTHRACITE IN WYOMING, LEHIGH, AND SCHUYLKIL REGIONS, FROM 1820 TO 1876.

Years.	Wyoming. Per cent.	Lehigh. Per cent.	Schuylkill. Per cent.	Years.	Wyoming. Per cent.	Lehigh. Per cent.	Schuylkill. Per cent.
1820.....	40	34	25	1849.....	23	24	52
1821.....	30	45	24	1850.....	25	21	53
1822.....	24	55	20	1851.....	26	21	52
1823.....	14	72	13	1852.....	26	22	51
1824.....	12	76	11	1853.....	29	20	50
1825.....	5	76	18	1854.....	27	20	52
1826.....	5	59	35	1855.....	27	18	54
1827.....	5	48	46	1856.....	28	19	52
1828.....	6	36	57	1857.....	29	19	51
1829.....	12	22	65	1858.....	32	20	47
1830.....	27	22	50	1859.....	34	21	44
1831.....	34	20	45	1860.....	34	21	44
1832.....	27	18	54	1861.....	38	21	40
1833.....	27	22	50	1862.....	39	17	43
1834.....	11	28	60	1863.....	39	20	40
1835.....	16	23	60	1864.....	39	20	40
1836.....	15	21	63	1865.....	34	19	46
1837.....	13	25	61	1866.....	39	17	44
1838.....	10	29	60	1867.....	42	16	41
1839.....	15	27	57	1868.....	43	18	38
1840.....	17	27	55	1869.....	44	14	41
1841.....	20	15	64	1870.....	49	19	31
1842.....	23	25	51	1871.....	44	14	41
1843.....	23	21	55	1872.....	48	19	32
1844.....	23	23	53	1873.....	51	16	32
1845.....	23	21	55	1874.....	47	19	33
1846.....	23	22	54	1875.....	53	14	32
1847.....	20	22	57	1876.....	44	21	34
1848.....	22	22	55				

To the graphic representation of the coal production I have added the chart lines showing the production of pig iron and petroleum from reliable data. (See Chart at bottom of the two preceding pages.)

INDEX OF CURRENT TECHNICAL LITERATURE.

EXCHANGES.

[In this department will be given abstracts of the more important original articles contained in current technical periodicals at home and abroad.]

The following gentlemen have kindly consented to assist in making the reviews of current technical periodicals :

JOHN RANDOLPH, Mining Engineer, New York.
Prof. TROWBRIDGE, School of Mines, Columbia College, New York.
Prof. H. S. MUNROE, " " " " "
Prof. T. EGLESTON, " " " " "
ARTHUR F. WENDT, Mining Engineer, New York.
MANSFIELD MERRIMAN, Yale Scientific School, New Haven, Connecticut.
FRANKLIN GUITERMAN, Mining Engineer, Cincinnati, Ohio.
Prof. P. de P. RICKETTS, Ph. D., School of Mines, New York.
Prof. E. A. FUERTES, Cornell University, Ithaca, New York.

Transactions of the North of England Institute of Mining and Mechanical Engineers, April, May and June, 1877.—Geology of Northumberland, by G. A. Lebour.... An improved method of detecting small quantities of firedamp, by A. L. Stevenson. (To render visible the cap of the flame of the safety-lamp when caused by very small quantities of gas, the author suggests the use of cobalt glass either in the side of the lamp or in form of spectacles. It will absorb the rays from the brighter part of the flame, and render the danger-cap visible.).... Method of cleaning coals at Pit No. 5, Lens, by M. Remaux, translated by John Daglish. (The coal, coming from shaft of small size, is turned into a large iron hopper, and passes to an inclined belt having a motion of ten feet per minute, on which it spreads out one foot thick. It then slides on an inclined perforated plate three feet three inches long, which screens off the dust. From this it goes to a second belt, inclined 24° and sixteen feet long, having a speed of sixty feet per minute. On this it spreads itself two inches thick, and is picked by girls as it passes, going from it into a chute and emptying into cars.) .... A new steam hand-gear for starting and reversing winding engines used in Belgium, by Professor Herschel. J. C. R.

The Metallurgical Review, Vol. 1, No. 1.—Mechanical treatment of metals, by Prof. R. H. Thurston (this article appears elsewhere, condensed, in the JOURNAL).... New iron district of Ohio, by E. C. Pechin. (Description and analysis of the ores, coal and limestone used in the furnaces now in operation, with estimates of cost of iron, which appear very low.).... Danks Furnace, at the Millvale Works by John I. Williams. (Description of improvements in the construction and operation, with tests of iron produced.).... On Steel, by Wm. Metcalf. (Mr. M. calls attention to the fact that engineers require an amount of contraction of area and extension of length incompatible with the best results obtainable for tensile strength; and that 0·90 carbon steel represents the maximum resistance in all but compressive strains, and hence should not break so quickly from shock as milder steels.).... Studies of elemental iron and its modifications, by Prof. Henry Wurtz.... Protecting the lining of blast furnaces, by Joseph D. Weeks. (Iron plates built into brickwork of stack near tunnel head.).... Determination of phosphorus in iron, steel and ores, by H. J. Preusse. (Method employed at the Edgar Thomson Steel Works.).... The Siphon Tap in lead smelting, by C. Kirckhoff. (This tap is inapplicable where much matte is produced.) *No. 2.*—Mechanical treatment of metals continued, by Prof. R. H. Thurston.... New iron district of Ohio, II., by E. C. Pechin. (Attention is called to the advantages to be gained by using an admixture of coke, larger furnaces, and calcining kilns; also to the waste of fuel and poor construction of existing furnaces.).... Whitwell stoves in the West (list of).... Coal washing, by S. Stutz.... A third form of carbon in car-wheel irons. (States that cold-blast irons have a larger percentage of silicon than hot-blast. The contrary, however, has been proved by many analyses.).... On resistance of steel to vibration and shock, by Wm. Kent. (An answer to Mr. Metcalf's paper On Steel in the September number of the *Review*. Mr. Kent refutes Mr. Metcalf's statement, that a steel which presents a maximum resistance to extension, torsion, shearing and transverse strain should be best able to resist shock.) A. F. W.

Engineering, Sept. 7.—The Railways of Japan; (description of lines in operation and proposed).... Institute of Naval Architects. (Account of Glasgow meeting continued.).... Retort stoking machinery. (Description of Rowland's at the New York Gas Works.).... Parker's and Weston's compound steam pump, description of.... Water ballast, by Mr. Benj. Shartell. (Paper read before Institute of Naval Architects at Glasgow).... The upward jets of Niagara, by W. H. Barlow.... Notes from the south-west.... Railway accidents for 1876.... Board of Trade report.... The Thames Valley main drainage.... The Pennsylvania Railroad, No. XXXVI.... Details of cylinders, piston, crosshead.... Notes on the effect of punching on iron and steel plates, by A. C. Kirk; read before the Institute of Naval Architects at Glasgow.... Wave motion, by Osborne Reynolds .... Locomotive fire-boxes continued.... Foreign notes.

Sept. 14.—American Iron and Steel Works, by W. L. Holley and Lenox Smith, IX. ... Works of the Bethlehem Iron Company continued.... Fixing boiler tubes, experiments by W. H. Shock, U.S.N..... The Pennsylvania Railroad continued .... Details of guide bars, connecting and coupling rods.... Feed pumps, cylinder, and pet cocks.... Twenty minutes with our commercial marine steam fleet in 1877, by J. R. Ravenhill; read before Institute of Naval Architects at Glasgow.... Notes.... The Eddystone lighthouse.... The Assimilation of Patent laws.... Edison's telephone.... Bo'ness Harbor Works.... Eight-horse steam plowing engine, by Messrs. Burrel & Sons, Thetford.... The removal of sand bars, experiments on a new system, by M. C. Bergeron.

Colliery Guardian, Sept. 28.—Literary notices.... The course of the iron trade .... Iron and steel in Belgium.... Iron and Steel Institute, report of meetings and papers.... Miscellaneous notes and correspondence.

Oct. 5.—Literary notices.... The foreign coal and iron trade, from 72 to 76 inches.... The use of constants applied to mining analyses of expenses, by H. Phillips.... Hall and Barker's self-tipping hoists.... Papers read before the Iron and Steel Institute.... Miscellaneous notes and correspondence.... Operation of the South Staffordshire Mines Drainage Act. A. F. W.

NOTES.

FLOODING OF THE GODERICH, ONTARIO, NEW SALT MINE.—We are in receipt of information stating that the shaft now being sunk was recently flooded during a severe storm on Lake Huron. Work has been completely suspended on the same, and as we understand, the shaft, down some 60 feet, has caved in.

OLD LIGHTNING RODS.—Dr. Munke quotes a passage from the Talmud, written in the fourth or fifth century of our era, permitting the use of iron "as a protection from lightning and thunder." Wiedermann, in an editorial note, adds that the Egyptians appear to have used gilded masts "for warding off the bad weather coming from heaven."—*Ann. der Phys. u. Chem.*

LARGE TRANSFER OF OHIO COAL LANDS.—Six thousand acres of land belonging to the Ohio Great Vein Mining Company, Perry county, was recently disposed of. The sale aggregated $585,388. Mr. A. W. Scott bid in for the Ohio Iron Company, at Zanesville, in all about 600 acres, for $31,000. Four years ago the property would have brought $1,000,000.

PRODUCTION OF MANGANESE IN LOUISIANA.—The New Orleans *Times* says: "The manganese mines, near Cave Spring, are being worked with fair success. The company have their mines in full blast, and about sixteen tons per day of twenty-four hour hours are being extracted. The quality of the ore is 76 per cent. of peroxide of magnesia."

REDUCTION OF BRITISH LABORERS' WAGES.—The lockout of the iron-workers in the Clyde shipyards, who demanded an increase of wages, began on the 20th inst. The number affected as yet is small, but men will be dismissed as the contracts expire. There is great depression in the Forest-of-Dean iron district. The forgemen of Forestvale received notice on Saturday that they must accept a 5 per cent reduction of wages or terminate all contracts. Nearly all the strikers on the Great Southern and Western Railway of Ireland have returned to work.

STRIKE OF STAFFORDSHIRE COLLIERS.—Cable advices from London of yesterday says : The Staffordshire colliers are now voting whether they will accept the reduction insisted on by the proprietors. As far as the returns are known, a large majority are against acceptance. Five thousand colliers are now idle and two thousand more go out on Saturday. The result of the voting will be announced to-day. Later advices state that the colliers have decided to strike by a majority of five hundred.

FAILURE OF THE BAY STATE IRON COMPANY OF BOSTON.—This company being financially embarrassed, held a meeting of its creditors on the 3d inst., to whom a report of the company's affairs was made as follows: Liabilities on notes, $414,594.13; on accounts, &c., $87,082.14, making a total of $501,676.27. Of this indebtedness $39,714.81 matured since Oct. 1, and was paid; about $310,000 is in favor of the Boston banks, and $100,000 in favor of New York parties. None of the property is mortgaged, and the paper held by the banks is indorsed by John H. Reed & Co., the company's selling agents. The assets are real estate, buildings and machinery at South Boston, $678,158; real estate, furnaces and mines at Port Henry, N. Y., $300,000; land at Beverly, $15,000; quick assets, $286,569.07, making a total of $1,279,727.07. In addition to these assets there are suspended claims, principally against two railroads in process of construction, amounting to $472,368.6, worth 50 cents on the dollar. The company propose to convey all this property to three trustees in behalf of the creditors, who are to carry on the business not exceeding two years. Any time after one year, on a demand of the majority in value of the creditors, the trustees are to wind up the affairs by sale and distribution among the creditors. A committee of five of the largest creditors was chosen to consider the proposal. John Gardner has accepted the position of treasurer of the company. Under this management the means will be provided for meeting all the obligations of the company and for paying the debts as they mature.

ASSAY DEPARTMENT OF THE ENGINEERING AND MINING JOURNAL.

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STATISTICS OF COAL PRODUCTION.

This is the only Report published that gives full and accurate returns of the production of our Anthracite mines.

Comparative Statement for the week ending Oct. 20, and years from Jan 1st.

Tons of 2,240 lb.	1877.		1876.	
	Week.	Year.	Week.	Year.
Wyoming Region.				
D. & H. Canal Co.	12,912	1,297,468	52,231	1,471,495
D. L. & W. RR. Co.	34,438	1,367,445	70,195	1,381,427
Penn. Coal Co.	30,937	777,896	29,292	822,084
L. V. RR. Co.	26,320	673,864	17,964	769,360
P. & N. Y. RR. Co.	505	33,436	760	18,249
C. RR. of N. J.	39,215	973,204	41,315	1,036,466
Penn. Canal Co.	16,055	267,871	15,896	331,313
	160,392	5,391,184	227,653	5,830,394
Lehigh Region.				
L. V. RR. Co.	98,472	2,666,285	91,287	2,092,420
C. RR. of N. J.	30,327	1,280,120	43,422	1,089,886
D. H. & W. B. RR.	1,662	22,674	....	32,324
	130,481	3,869,079	134,709	3,214,630
Schuylkill Region.				
P. & R. RR. Co.	162,706	5,422,186	170,818	3,679,314
Shamokin & Lykens Val.	*13,167	575,840	28,974	749,142
	172,963	5,997,026	199,792	4,428,456
Sullivan Region.				
Sul. & Erie RR. Co.	763	15,481	416	28,109
Total	464,599	15,272,770	562,600	13,501,589
Increase	....	1,770,181	....	....
Decrease	78,001	....	....	....

The above table does not include the amount of coal consumed and sold at the mines, which is about five per cent of the whole production.

* This report is not full.

Receipts and shipments of coal at Chicago, Ill., for the week ending Oct. 20, and year from January 1:

	Week. Tons.	Year. Tons.
Receipts	35,517	1,315,413
Shipments	7,006	293,304

Coal Cleared on the Canals of the State of New York for the week ending Oct. 22, and years since the opening of navigation:

Tons of 2,000 lb.	1877.		1876.	
	Week.	Year.	Week.	Year.
Anthracite	40,299	788,782	38,881	622,475
Bituminous	7,309	217,638	7,958	236,645
Total amount cleared	47,608	1,006,420	46,839	859,120
Of the above, there was cleared at tidewater ports, viz., New York, Albany, West Troy, and Waterford.	35,276	694,437	26,74[illegible]	377,942
Cleared at internal ports	12,332	311,983	20,09[illegible]	481,178

Belvidere Delaware RR. report for week ending Oct 20.	Week	Year. 1877.	Year. 1876.
Coal for shipment at Coal Port (Trenton)	6,575	19,713	226,796
" " " South Amboy	11,306	451,074	349,158
Coal for distribution	5,967	152,372	137,023
Coal for Company's use	2,503	58,685	55,171

The shipments of coal at Cleveland, Ohio, for the week ending Oct. 22 were as follows: shipped coastwise, 6,904 tons; total for year, 229,844 tons; foreign shipments, 1,411 tons; total for year, 71,168. Total of coastwise and foreign shipments for week, 8,306; for year, 301,012 tons.

The decrease of shipments of Cumberland Coal over the Cumberland Branch, and Cumberland and Pennsylvania, Railroads amounts to 124,958 tons, as compared with the corresponding period in 1876.

Perth Amboy business:

	Tons.
Received for the week	27,223
Shipped for the week	21,334
On hand Oct. 20	92,509

The Exports of Coal from Baltimore for the week ending Oct 20 were 397 tons, and since January 1st, 24,308 tons against 22,589 tons for the corresponding period of 1876.

The Receipts of Coal at Rondout, N.Y., by the Delaware & Hudson Canal for the week ending October 24 were 13 boats, carrying 1,630 tons.

Receipts of Coal at Boston, for the week ending Oct. 19 and years from Jan. 1.

Tons of 2,240 lb.	1877.		1876.	
	Week.	Year.	Week.	Year.
From				
Alexandria and Georgetown	7,255	56,157	....	52,708
Philadelphia	34,584	559,206	10,645	477,028
Baltimore	11,352	128,698	2,037	125,732
Other places	6,217	206,040	3,884	241,947
Great Britain	3,962	10,931	201	4,339
Nova Scotia	1,790	34,689	892	20,798
Total	65,160	995,741	17,659	923,052

The production of Bituminous Coal for the week ending Oct. 20 was as follows:

Tons of 2,000 lb., except where otherwise designated.

Cumberland Region, Md.	Week, Tons.	Year, Tons.
Tons of 2,240 lb	46,793	1,235,563
Barclay Region, Pa.		
Barclay RR. tons of 2,240 lb	6,240	264,904
Broad Top Region, Pa.		
Huntingdon and Broad Top RR.	2,873	109,868
*East Broad Top	1,160	40,629
Clearfield Region, Pa.		
*Snow Shoe	1,146	29,669
*Tyrone and Clearfield	30,948	1,047,291
Allegheny Region, Pa.		
*Pennsylvania RR.	13,238	143,479
Pittsburg Region, Pa.		
*West Penn. RR.	4,665	140,362
*Southwest Penn. RR.	564	30,545
*Penn & Westmoreland gas coal, Pa. RR.	23,187	518,959
*Pennsylvania RR.	11,134	287,206

* For the week ending Oct. 14.

The Production of Coke for the weed ending Oct. 14.

Tons of 2,000 lb.	Week.	Year.
West Penn. RR.	1,034	46,195
Southwest Penn. RR.	16,009	484,403
Penn & Westmoreland Region, Penn. RR.	1,655	50,237
Pittsburg, Penn. RR.	2,220	88,008
Total	20,918	668,843

COAL TRADE REVIEW.

NEW YORK, Friday Evening, October 26, 1877.

Anthracite.

As announced last week would be the case, the Delaware, Lackawana & Western Railroad Company offered at auction on Wednesday 125,000 tons of coal. The prices realized were a surprise to almost the whole trade. In fact, when we consider that every pound of the coal was wanted, that the attendance was large and the purchasers well distributed; that the conditions were better for maintaining prices than at any previous sale since the combination was dissolved, we can only look upon it as indicating a very unsatisfactory future for the producers of anthracite coal. The following quantities of the various sizes were sold and the accompanying average prices received.

	Tons.	Average prices received.
Steamer	10,000	2 31¾
Grate	25,000	2 44½
Egg	20,000	2 50
Stove	50,000	2 85½
Chestnut	15,000	2 39½
Pea	5,000	1 53
	125,000	2 56

One of the daily papers made the announcement that these prices show an advance; so they do when compared with the prices of the last sale early in the summer, but as compared with the circulars issued by the Delaware & Hudson Canal Co. and Pennsylvania Coal Co., they show an average decline of about 25 cents per ton. This clearly indicates that those companies did not misjudge the condition of the market. And the supposition that their low circulars were prompted by opposition to the Reading, seems to be entirely unwarranted. There is no doubt the Lackawanna Companies have made strong efforts to recover lost ground. Buyers realize that the companies intend to sell all the coal the market will take, be the price almost what it may, and the knowledge that the market will be met under all circumstances has a very demoralizing effect, and really puts prices in the hands of dealers and consumers. Previous to the auction sale, most of the important buyers were guaranteed prices no greater than would be realized at the sale. Such being the case, it would have been folly for them to have entered into competition and have assisted in fixing for themselves a higher price than would rule were they to leave the auction severely alone. So long as there is an inclination to meet the lowest prices, whether they show a profit or loss, and these prices are to be named by the public through the Delaware, Lackawanna & Western Railroad Co.'s auction sales, so long shall we see very low prices, for we can expect no overmodesty on the part of the public. Under the present policy it would be better for all, or none, to sell coal at auction.

Previous to the sale business was very quiet, buyers awaiting its result. Immediately after it, the Reading Company offered alongside in this city such of its free-burning white-ash coal as it had afloat on this market, at 20 cents per ton advance over the average auction prices. This resulted in a very active business for this company. The other companies have not shown an inclination to meet the situation promptly, and the result is that business with them has been quiet.

The Lehigh Coal Exchange has issued a circular quoting prices as follows:

Lump	$3.50	Stove	$3.00
Broken	2.85	Chestnut	2.60
Egg	2.85		

W. H. Meeker quotes, f. o. b. Hoboken, as follows:

	Lump	St'r	Br'n	Egg	St'e	Ch't
Lackawanna Valley	$2.50	$2.50	$2.65	$2.70	$3.00	$2.60
Kingston	2.50	2.50	2.65	2.70	3.00	2.60
Chauncey–Red Ash	—	—	—	2.80	3.10	2.70
Wilkesbarre	2.50	2.50	2.65	2.70	3.00	2.60
Beaver Br'k Lehigh	3.50	—	2.85	2.85	3.00	2.60

The Lehigh & Wilkes-Barre Coal Company quotes, f. o. b. Port Johnston:

Lump	$2.60	Egg	$2.75
Steamer	2.60	Stove	3.00
Broken	2.70	Chestnut	2.60

The Pennsylvania Coal Company has not issued a circular since the sale, although it claims to be in the market with a small quantity of coal. A. S. Swords is prepared to sell Pittson coal either for river or eastern shipments at prices to compete with the market, although he has not issued a circular. The Delaware and Hudson Canal Company will have but little coal to offer for a week or two and has concluded not to issue a circular before Nov. 1.

During the past week coastwise freights have taken a strong upward tendency, the rate to Boston having advanced from 25c to 30c, more than covering the decline in the price of coal. The rates from Philadelphia are also stronger. However, highrr rates are always looked for at this season of the year and during the winter months.

The Scranton *Republican* says: It is rumored that C. Parrish & Co., as well as the individual operators here, purpose reducing the pay of the miners to the amount of ten per cent., recently advanced. With some the reduction took effect on Monday, and with others on the first of the month. Whether this step will inaugurate another strike is of course to be seen. The market rates for coal are decreasing, and the operators claim it to be an absolute impossibility to pay the extra ten per cent., and that the prices barely permit the payment of the former wages. The shipments of coal into the various markets is now immense, and in addition to the reduction above referred to, it is more than likely that three-quarter or half time will be the next turn that the operators will have to make. While there is a probability that the reduction will be enforced, commencing with to-day for several operators here, the plan of giving notifications of the reduction to-day, and having it go into effect the first of the month, is probably the one that will most generally prevail.

It is very evident that all the advances lately made in wages must be taken off, and with the prospects of the coal trade for the winter, it is questionable if even the wages paid before the strike will meet the requirements of the operators. We are informed that owing to the "unpleasantness" of remaining in the Schuylkill region, the worst of the "Molly Maguires" have gone to the Wyoming region. These, with the forty or forty-five leaders in the late strike, who have been most indiscretely discharged by the Scranton companies, while order was maintained by the military, and who, from their inability to leave the region, remain as a constant source of agitation among the strikers, will probably yet give this region much trouble.

In the Schuylkill region the production has apparently reached its maximum for this year. The lack of labor is beginning to be felt since the Lackawanna companies went to work, for the men who emigrated to the Schuylkill mines have now returned to their more congenial homes. The low prices of coal and the still high rates of freight have closed some of the collieries in the Schuylkill, and unless a reduction in tolls be promptly made, the output of this region will probably show a decline.

The production of coal last week was 464,599 tons, as compared with 436,359 tons the previous week and 562,600 tons the corresponding week of 1876. The total shipments from January 1 have been 15,272,770 tons, as against 13,501,589 tons for the corresponding period of 1876, showing an increase this year of 1,770,681 tons.

Bituminous.

The low prices of anthracite are checking the demand for bituminous. The companies are now mostly engaged in filling their regular contracts, the incidental business being quite small. The Cumberland region showed a gain last week as compared with the corresponding week of 1876, while the Clearfield region showed a production of nearly 31,000 tons for the second week of this month. These figures speak quite encouragingly for these districts when we consider all they have to contend with. Some delay has occurred during the past week in the shipments of Cumberland coal, owing to an accident to one of the locks on the Chesapeake & Ohio canal. Quite an accumulation of coal in boats is reported from Georgetown. This is the result of a scarcity of vessels in which to ship to the markets where required.

New York.

Wholesale Prices of Anthracite Coal f. o. b. at the Tide Water Shipping Ports per ton of 2240lb.

	Lump.	Steamer.	Grate.	Egg.	Stove.	Chestnut.
Wyoming Coals.						
Wilkesbarre at Port Johnston	2 60	2 60	2 70	2 75	3 00	2 60
Kingstown at Hoboken	2 50	2 50	2 65	2 70	3 00	2 60
Lehigh Coals.						
Sugar Loaf, at Hobok. & Amb	3 50	.. ..	2 85	2 85	3 00	2 60
Lehigh at Perth Amboy	3 50	....	2 85	2 85	3 00	2 60
Hazleton at Hoboken	3 50	....	2 85	2 85	3 00	2 60
Lehigh Coal Exchange	3 50	....	2 85	2 85	3 00	2 60
Mount Pleasant at Hoboken	3 50	....	2 85	2 85	3 00	2 60
Cross Creek at Port Johnston	....	....	2 85	2 85	3 00	2 60

	Per ton.
Freight from Hoboken and Weehawken to New York	40c.
" " Elizabethport & Port Johnston to N. Y	40c.
" " South Amboy to New York	40c.

Freight by the boats of the companies from Hoboken, Rondout, Port Johnston, Weehawken, South Amboy and Perth Amboy to New York City and vicinity 50c.

Wholesale Prices of Bituminous Coal.

Domestic Gas Coals.

Per ton of 2240 lb.	At the Shipping Ports.	Alongside in New York.
Westmoreland and Penn. at Greenwich, Philadelphia	$4 70	$5 50
" " at S. Amboy.	5 00	5 50
Kanawha at Richmond	4 10	5 40
Red Bank Cannel Pa. at Philadelphia	8 00	8 50
Youghiogheny, Waverly Co., at Balt	4 50	5 05
Despard, West Va	4 50	6 00
Murphy Run, West Va., at Baltimore	4 50	5 85
Fairmount, West Va., " "	4 40	5 70
Newburg Orrel, Md. " "	4 50	6 00
Cannelton Cannel, West Va	....	10 00
" Splint " at Richmond.	6 00	7 00
" Gas Coal at Richmond	4 00	5 65
Peytona Cannel W. Va. at Richmond	....	10 00

Manufacturing and Steam Coals.

Cumberland at Georgetown and Alexandria, Va	2 85@3 10 — 4 35@4 50
Cumberland, at Baltimore	3 10@3 25 — 4 35@4 50
Clearfield f. o. b. Canton, Baltimore	3 25@.... — 4 35@4 50

Clearfield "Eureka" and "Franklin" at mines per ton 2,000 lb. 75c.; f.o.b. Baltimore and Philadelphia per ton of 2,240 lb., $3.25; f.o.b. South Amboy, $4.25; alongside at New York, $4.50.

Foreign Gas Coals.

	Sterling.	Am. cur'cy
Newcastle, at Newcastle-on-Tyne	8/6@10/6	5 50@ 6 00
Liverpool House Orrel, at Liverpool	25/	13 00
Ince Hall Cannel "	35/6	18 00
" Gas Cannel " ...	25/6	10@10 50
Scotch Gas Cannel, at Glasgow, nominal,	25/	7 50
	Gold.	
Block House. at Cow Bay, N. S.	1 75	4 50
Caledonia, at Port Caledonia	1 50	4 25
Glace Bay, at Glace Bay	1 00	4 25
Lingan, at Lingan Bay	1 75	....
International mines at Sydney	1 75	4 50
Pictou, Vale mines, at Pictou	2 00	4 7

Retail Prices in New York.

Anthracite.

Per 2000 lbs.	Grate and Egg.	Stove.	Chestnut.
Pittston coal, delivered	$4 50	$4 50	$4 50
Lackawanna coal, delivered	4 25	4 25	4 25
Wilkes-Barre, delivered	4 25	4 50	4 25
Lehigh and Locust Mountain, del'd	4 25	4 50	4 25

Bituminous.

Liverpoo House Orrel, delivered, per ton of 2000 lb	$18 00
Liverpool House Cannel " " "	18 00
American " " "	11 00
Cannelton Block, or splint, " " "	10 00
American Orrel " " "	12 90
Red Bank Cannel " " "	7 00
Cumberland " " "	9 00

Baltimore. Oct. 24, 1877.

Specially reported by Messrs. E. STABLER Jr., & Co.

Wholesale Prices per ton of 2,240 lb.

Hard White Ash.

AFLOAT BY CARGO.

Lump and Steamboat	$3 75	Stove	$3 75
Broken	3 75	Chestnut	3 50
Egg	3 75		

Shamokin, Free Burning White Ash.

Egg and Stove $4 00 | Chestnut $3 75

From wharf or yard to the trade, 75c. per ton additional.

In cars in dealers' yards or on switch, 15c. per ton additional

Lykens Valley Red Ash.

AFLOAT BY CARGO.		BY RAIL IN CARS.	
Broken	$4 08	Broken	$4 30
Egg	4 33	Egg	4 55
Stove	4 33	Stove	4 55
Chestnut	3 75	Chestnut	3 95

Boston. Oct. 20, 1877.

The market continues to tend downward. All the anthracite collieries, with a few insignificant exceptions, will be at work next week, and in view of this fact dealers refuse to stock up in excess of their immediate requirements. Receipts here have been large this week, both of domestic and foreign, the latter chiefly gas coals from the Provinces, which had been contracted for previously. Three more steamers have arrived from Newcastle, England—the Gresham, with 1,551 tons; the Boadicea, with 991 tons; and the James Barras, with 1,420 tons—all to the Boston Gaslight Company.

We quote Boston wholesale prices as follows:

Anthracite, broken	$4 00@4 25	Cannel, English	$16 00
do. egg	4 00@4 25	do. Buckeye	10 00
do. stove	4 25@4 50	Lingan	4 50
Cumberland	4 50@4 75	Pictou	4 75
Clearfield	4 25@4 50	Penn	6 00@6 10
Westmoreland	6 00@6 10	Youghiogheny	6 00@6 10
Caledonia	4 25		

—Commercial Bulletin.

Buffalo, N. Y. Oct. 22, 1877.

Specially reported by C. M. UNDERHILL.

The following are the prices of Lackawanna, Scranton, Henry Clay and Black Diamond coals, per ton of 2,000 lb. for Buffalo local trade for the present.

	To Dealers.			To Consumers.
	F. O. B.	On car or boat.	In yard, screened.	Delivered at Retail.
Grate	$4 45	$3 95	$4 15	$5 20
Egg	4 45	3 95	4 15	5 20
Stove	4 70	4 20	4 40	5 45
Chestnut	4 60	4 10	4 30	5 35
Blossburg	4 00	3 85	4 35	5 00

Our yards are located as follows: Lackawanna coal at 667 Exchange Street, also at foot of Ohio street. Scranton, Henry Clay and Black Diamond coals at yard foot of Genesee street.

Chicago, Ill. Oct. 24, 1877.

Specially reported by Messrs. RENO & LITTLE.

Retail prices of coal delivered per ton of 2,000 lb.

Lackawanna Stove	$6 75	Erie and Brier Hill	$5 50
" Chestnut	6 75	Wilmington and Ill.	3 50@4 00
" Grate	6 75	Blossburgh	6 50
" Egg	6 50	Piedmont	7 50

Cincinnati, O. Oct. 24, 1877.

Specially reported by the Consolidated Coal and Mining Co.

The market for Youghiogheny coal has been unsettled by the low stage of water in the river during the past few weeks. Stocks in the river have been nearly exhausted, and what little there is, is held at 10 cents per bushel, afloat. Dealers are now getting 12 to 14 cents per bushel, delivered to consumers. Ohio River coal brings 7 cents afloat and 11 cents delivered. Anthracite coal has had a tumble since the mines resumed in the Wilkesbarre region, and dealers are now offering at $5.50 per ton of 2,000 lbs., on cars here. Lehigh, $6.50. Anthracite delivered at $7.00 to $7.50.

	AFLOAT. Per bush. of 72 lb.	AFLOAT. Per ton 2,000 lb.	DELIVERED. Per bush. of 72 lb.	DELIVERED. Per ton 2 000 lb.
Youghiogheny lump	10c.	$2 78	12c.	....
" nut	8c.	2 22	10c.	....
" slack	4½c.	1 25	8c.	....
Camden, W. Va	7c.	1 94	11c.	....
Peytona Cannel	13c.	3 71	18c.	....
Connellsville coke	....	3 60	10c.	....
Youghiogheny coke	5c.	2 64	8c.	....

Anthracite per ton of 2,000 lb.

	Wholesale.	Retail.
Wilkes-Barre and Lackawanna (all sizes)	$5 50	7 00
Lehigh	6 50	7 50

Cleveland, O. Oct. 24, 1877.

Specially reported by F. A. BATES, Esq.

There is but little change to note in prices. Some reduction has been made in Brier Hill and Straitsville coal. Shipments of the former have been larger than usual, probably owing largely to this reduction. Trade is comparatively dull for this season of the year. Canada freights are advancing, while west bound freights remain unchanged.

Per ton of 2000 lbs. f. o. b. vessels.

WHOLESALE.

Brier Hill (Church Hill)	3 30
" " No. 2 Grades	3 10
Straitsville Lower Vein	2 75
Hocking Valley	2 75
Massillon [No. 2 grades 15 cents less)	2 75
Tuscarawas Valley	2 30
Columbiana	2 30
Nut coal, various grades	1 90@2 20
Screenings, " "	1 35@1 75
Youghiogheny gas coals	3 75

RETAIL TRADE.

	1 to 10 tons.	10 tons. upw'd.
Brier Hill lump	$4 00	$3 75
Massillon and Mineral Ridge lump	3 75	3 50
" " " " nut	3 50	3 25
Straitsville Lower Vein, and Hocking lump	3 60	3 35
" " " " nut	3 40	3 15
Rich Hill lump	3 50	3 35
" " nut	3 25	3 00
Columbiana, lump	3 00	2 75
" nut	2 50	2 35
Lacka'a., Wilkesbarre and Pittston egg and grate	6 10	5 85
" " " stove	6 25	6 00
" " " chestnut	6 25	6 00

Lehigh $1 00 per ton higher.
All sales to be strictly cash with order or C. O. D.

Hamilton, Ont. Oct. 24, 1877.

Specially reported by H. BARNARD.

Retail Prices, Delivered per ton of 2,000 lb.

Scr. or Wilkes-B. Grate	$5 00	Lehigh Lump	$6 00
" " Egg	5 00	Brier Hill	5 50
" " Stove	5 25	Massillon	4 50
" " Nut	5 25	Smithing	5 50

Louisville, Ky. Oct. 24, 1877.

Specially reported by Messrs. BYRNES & SPEED.

Wholesale per bushel of 72 lb.

Pittsburg	11c.	Kentucky nut	8@9c.
Raymond City	—	Kentucky	8c.

Retail per bushel of 72 lb.

Pittsburg	14c.	City Make Coke	9c.
Raymond City	13c.	Pine Hill	12c.
Indiana Cannel	17c.	Kentucky	10 to 11c

Anthracite $7.50 per ton of 2,000 lb.

Montreal. Oct 25, 1877.

COAL.—The cost of freight on coal from New York to this city has increased over a dollar a ton since the beginning of the present month, much more than counterbalancing the decline in prices at the mines, but as supplies on hand, along with what is on the way here, are considered by many to be sufficient to last until the opening of navigation next spring, there is no present prospect of an increase in price. Some coal dealers continue to charge higher prices are than charged by others. Soft coal continues to arrive freely, and is delivered at low rates, ex-ship. The following are the retail prices per net ton of 2,000 lbs. delivered: Lackawanna and Pittston, stove size, $6@6.25; do do, nut and egg size, $5.75@6; Newcastle smiths', $4.50@6.00; inferior smiths', $4.50@5.00; grate, $5.00@5.50; Scotch steam, $4.50@4.75; Lower Ports steam, $4.25@4.50. coke, per chaldron, $2.50; charcoal, per bushel, 17@25c, according to quality and quantity taken. An evening contemporary has for some weeks past been quoting coke at $2.80 per chaldron, although the Gas Company has all along been delivering at $2.50 per chaldron.—*Gazette.*

Milwaukee, Wis. Oct. 16, 1877.

Specially reported by Messrs. R. P. ELMORE & Co.

Retail price per ton of 2,000 lb.

Anthracite, egg, chestnut, and stove	$6 50		
Lehigh lump	$7 00	Connellsville coke on RR.	
Briar Hill	$5 25	track	$7 25
		Straitsville	4 80

Philadelphia. Oct. 25, 1877.

Specially Reported.

The dullness in the trade continues and prices are very unsettled. The result of the auction sale has been to depress still more an already much demoralized market. It is impossible for the individual operators to meet the present condition of the market and pay the present tolls and wages. We though so at the time of the rise. The Reading Company shows a disposition to reconsider the matter of tolls and there may be some concessions made in that line before the end of the week. Nominally the tolls are one-third of the price on board, and if we stop there we have an evident disposition to share in any decline, but there is a minimum rate fixed, which is higher than one-third of the highest price coal is selling at, so that the pro rata rate is a dead letter.

Vessels are in better supply than last week, but still scarce. Freights firm at $1.50 to Boston; 75c. to Washington; $1.25 to the Sound.

Richmond, Va. Oct. 22, 1877.

Specially reported by S. H. HAWES, Dealer in Coal.

Per ton of 2,240 lb., f. o. b.

Kanawha Cannel	$9 00	New River Bituminous	$3 30
Coalburg Splint	5 70	Clover Hill Coal	3 00
Lewiston "	5 70	James River Bitum	2 70
Kanawha Gas Coal	4 90	" " Carbonite	4 50

Sandusky, O. Oct. 24, 1877.

Specially reported by C. E. BLACK, Agt. Con. Coal & Mg. Co

We quote coal on cars at Sandusky, as follows:

Per ton of 2,000 lbs.

Anthracite.

	Grate.	Egg.	Stove.	Chestnut
Wilkes-Barre	$4 80	$4 80	$4 80	$4 80
Lackawanna	4 80	4 80	4 80	4 80
Lehigh	5 80	5 80	5 80	5 80

Bituminous.

Massillon	$2 90	Straitsville	$2 65
Del Carbo	2 65	Shawnee	2 65
Hocking Valley	2 65	Blossburg	4 75

Prices f. o. b. vessel for soft coal, 15c. advance on car prices. Prices retailed delivered 50c. above car prices.

San Francisco, Cal.

From the *Commercial Herald* of Oct. 18, 1877.

COAL—Imports from January 1 to Sept. 1:

	Tons.		Tons.
Anthracite	17,974	Vancouver Island	77,039
Australian	55,159	Rocky Mountain	123
Coos Bay	23,834	Saghalien	40
Cumberland	8,083	Seattle	83,067
English	63,062	Bellingham Bay	8,600
Chili	7,635	Ione, Cal.	2,127
Mt. Diablo,	68,698	Carbondale, Cal.	177

The market seems to be more sluggish than ever. The Central Pacific Railroad finds it to its interest to use largely of Ione Coal, poor as it is, while the Pacific Mail Company encourage the use of both Nanaimo and Seattle, each steamer going north loading up at alternate mines. The cargo price here of these two Coals is $7. The 510 tons Coronel per Clara sold at $5.50. Australian cargoes cannot be quoted better than $7@7.50. The arrivals this week embrace the following: Arcata, Coos Bay, 370 tons; El Dorado, Seattle, 1,800 tons; Hoogley, Australian, 1,750, tons; Emma, Coos Bay, 200 tons; Marmion, 1,350 tons, Nanaimo; Gem of the Ocean, 1,000; etc. There is a very decided falling off in the production in the Bellingham Bay, Coos Bay, and Mount Diablo mines, while the Nanaimo and Seattle mines show a large increase. The Pacific *Tribune*, published at Seattle, says: "The shipments of September were made on 11 vessels, and aggregated 9,644 tons. Of the above, 9 vessels, carrying 8,844 tons, loaded from the Seattle mine, and two vessels, with 800 tons, from the Renton mine. The Talbot Company shipped nothing. As compared with the shipments of September, 1876, the past month shows an increase of 5,649 tons, and the nine months ending September 30th, 1877. as compared with the

same months of 1876, show increase amounting to 15,252 tons, and this notwithstanding the terrible competition of other coals, the depressed condition of the market, and the unprecedentedly low prices prevailing. To give each company its proper and just credit, we append the following table, showing what each exported during the whole of the two years 1875 and 1876, and during the first nine months of 1877:

	1875	1876	1877
Seattle	56,887	77,849	76,282
Renton	10,454	16,613	6,150
Talbot	2,816	10,094	8,466
Total	70,157	104,556	90,898

We are, it will be seen, over twenty thousand tons ahead of the exports of the whole year 1875, and less than fourteen thousand tons behind the whole year 1876, and one-quarter of the year yet to go on. We give the report of each of the three companies since the first of January, 1875: Talbot, 21,374 tons; Renton, 33,219 tons; Seattle, 211,018 tons; total, 265,611 tons. One cargo has gone to Honolulu, one to Astoria, three or four to the southern coast of California, and the remainder, probably nineteen-twentieths of the whole, to San Francisco. We note the sale of the St. Lawrence's cargo of Wallsend—say 1,220 tons—at a slight advance upon the previous cargo sale.

Toledo, Ohio. Oct. 14, 1877.

Specially reported by Messrs. GOSLINE & BARBOUR.

We report prices of coal on cars at Toledo as follows:

Ton of 2,000 lb.

Straitsville lump	$2 70	Hocking Valley nut	2 30
" nut	2 30	Massillon lump	3 00
Shawnee lump	2 70	Cumberland	5 40
" nut	2 30	Blossburg	5 40
Hocking Valley lump	2 70		

Prices of hard coal on cars at Toledo are as follows:

Ton of 2,000 lb.

	Grate.	Egg.	Chestnut	Stove.
Pittston	$5 55	$5 55	$5 70	$5 80
Wilkes-Barre	5 55	5 55	5 70	5 80
Lackawanna	5 55	5 55	5 70	5 80
Lehigh	6 15	6 15	6 30	6 40

For retail delivery in city the prices are as follows: Stove and chestnut $6.45; grate and egg, $6.20 per ton; Lehigh, 60c. per ton additional.

Prices soft coal f. o. b. vessel for Lake shipments will be from 15 to 20c. per ton more than prices on cars.

Freights

Representing the latest actual charters up to Oct. 25.
Per ton of 2240 lb.

PORTS.	From Philadelphia.	From Baltimore	From Georgetown.	From Elizabethport, Port Johnson, South Amboy, Hoboken and Weehawken.
Augusta, Me.	....	....	....	1 75
Albany	....	....	....	....
Alexandria, Va	70	...	....	....
Brooklyn, N.Y.	....	....	....	....
Bangor, Me.	....	....	2 00	1 25
Bath, Me.	....	....	.. ..	1 25
Baltimore	55@65	....	....	....
Boston, Mass.	170@175	185@190	1 85	1 25
Bridgeport, Ct.	95	....	1 55	55
Bristol, R. I.	....	....	1 55	80
Beverly, Mass.	....	.. ..	....	1 25
Cambridgeport, Mass.	....	..	....	1 25
Charleston, S. C.	....	....	....	....
Danversport, Mass.	....	....	....	....
East Greenwich, R. I.	...	....	....	....
Fredericksburg, Va.	....	....	....	....
Fall River	1 25	1 50	1 55	80
Gloucester	....	....	....	....
Georgetown, D.C	70	.. ..	....	..
Hartford, Conn.	.. ..	2 00	....	....
Hoboken	....	....	....	....
Hudson, N.Y.	....	1 70	....	40
Jersey City	....	....	1 35	40
Key West, Florida	....	....	....	....
Medford, Mass.	....	....	....	....
Middletown	....	....	....	..
Milton Mass	....	....	....	..
Nantucket, Mass.	....	....	....	80
New Bedford	1 28	1 65	1 60	80
Newburyport	....	....	....	1 50
New Haven	....	1 50	1 55	70
New London	...	1 50	1 55	70
Newport	...	.	....	80
New York	95	1 40	1 45	40
Newark, N J	....	1 60	....	....
Norfolk, Va.	75	....	..	....
Norwich	120@125	1 60	.	1 04
Pawtucket	....	1 75	1 65	90
Philadelphia	...	75	....	...
Portland	1 50	...	1 85	1 25
Portsmouth, N. H.	160@165	2 00	1 85	.. ..
Providence	120@125	1 50	1 55	....
Rockland, Mass.	....	....	....	....
Rockport	....	....	....	....
Richmond, Va.	80	....	....	....
Saco	....	....	....	1 50
Salem, Mass.	155@160	....	....	1 25
Saugus, Mass.	....	....	....	....
Savannah, Ga.	....	....	....	....
Somerset, Mass.	1 25	....	1 55	....
Troy	1 12	....	....	....
Wareham	....	1 65	....	....
Washington	70@75	....	....	..
Wilmington, N.C.	1 40	75	..	.. ..
Weymouth, Mass.	...	....	....	....

* And discharging and towing. † And discharging. ‡ And towing. § 3c. per bridge extra.

Lake Freights on Coal.

The rates given below represent the latest actual charters.

From Buffalo to Chicago	0.30
" " " Milwaukee	0.25
" " " Toledo	0.20
" " " Sandusky	0.25
" " " Detroit	0.25
" " " Port Huron	0.30
" " " Marquette, Mich	0.80
From Cleveland to Chicago	0.50@0.55
" " " Milwaukee	0.45
" " " Marquette, Mich	1.00
From Sandusky to Chicago	0.50
" " " Milwaukee	0.45
" Oswego, N.Y., to Chicago	0.65
" " to Detroit, Mich	0.40
From Erie to Chicago	0.40
" Ashtabula to Marquette, Mich	0.80

Rates of Toll

For the above we refer to our issue Sept. 8.

For freights on *Lehigh and Wyoming Coal* we refer to our issue of Sept. 15.

For freights on *Schuylkill Coals* we refer to our issue of Sept. 15.

Freights on Bituminous Coals from the Mines to Tide Water Shipping Ports.

For the above see issue of Sept. 15.

IRON MARKET REVIEW.

New York.

FRIDAY EVENING, Oct. 26, 1877.

American Pig.—The market has been quieter this week with the demand only in a small way for prompt shipment before the close of navigation. The opinion still prevails that prices will not go lower, yet there is nothing to indicate an early advance. We continue to quote No. 1 foundry at $18@19; No. 2 foundry, $17@18, and forge, $16@17.

Scotch Pig.—We only note sales in lots of 100 tons Eglinton, 100 tons Glengarnock and 75 tons of Coltness on private terms. We quote Eglinton at $23.75@24.25; Glengarnock, $24.75@25; and Coltness, $26.

Rails.—There are sales of about 4,000 tons of steel rails reported to have been made, the prices of which are kept private. The proposed combination among the steel-makers, fully mentioned in our last, proved a *fiasco* at a meeting held in Philadelphia early in the week. The array of human nature was too great, one of the representatives failing to harmonize. It is not thought that further efforts will be made to bring about an understanding for the present. This failure will rather tend to increase the competition than otherwise. There are now considerable inquiries in the market, which will probably result in some business in a few days. We quote steel rails at mills at $40@$43, and iron at $33@$36.

Old Rails.—The sales for the week aggregate about 1,000 tons on private terms. We quote at $18.

Wrought Scrap.—Without business we quote at $23@$24.

Baltimore, Md. Oct. 22, 1877

Specially reported by Messrs. R. C. HOFFMAN & Co.

We have no change to note in the iron market. The demand continues fair at about quotations.

Baltimore Charcoal	$29@30	Mottled and White	$15@16 00
Virginia Charcoal	28@30	Charcoal C.B. Blooms	50@55 00
Anthracite No. 1	19@20	" " Billetts.	55@60 00
" " 2	18@19	Refined Blooms	45@50 00
Anthracite No. 3	17@18		

Boston. Oct. 20, 1877.

Pig continues in very good demand, and our outside prices are now easily obtained. The demand is in small lots for immediate consumption, and there is little speculative feeling. We quote $21.50 for No, 1; $20@20.50 for No. 2, and $19.50@20 for gray forge.

Bar continues unchanged, quoting $43@45 for refined, and $35@36 for common. Nails are in light demand at unchanged prices. Sheet is selling at 3@3¼c. per pound. Russia is quiet at 12c. currency. We quote, English spring steel at 7@8c. gold; 9@11c. for German; 9@11c. for machinery; 14@16c. for cast; 10@12c. for blister; 8c. for American spring; 13½@14c. for cast, 9c. for blister, and 8c. for machine.—*Commercial Bulletin.*

Buffalo. Oct. 22, 1877.

Specially reported by PALEN & BURNS.

No. 1 Ex Foundry	$20 55
No. 2 "	19 55
Gray forge	18 55
American Scotch A 1 Foundry	24 00
Cherry Valley B 1 "	23 00
" " No. 2 "	22 00

Per gross ton 4 months delivery here.

Chattanooga, Tenn., Oct. 23, 1877.

Specially reported by J. F. JAMES, dealer in pig iron, ores, etc.

There is nothing new to note in the condition of our market since last report. Prices remain unchanged. Demand continues about the same. Prospects for any early improvement not at all encouragiug. I quote as below free on cars at furnaces,

Tenn., Ala. and Ga. Charcoal, No. 1 Foundry	$18 00@19 00
Tenn., Ala. and Ga. Charcoal, No. 2 Foundry	17 00@18 00
Tenn., Ala and Ga. Charcoal, Gray Forge	15 00@16 00
Tenn., Ala. and Ga. Coke, No. 1 Foundry	19 00@20 00
Tenn., Ala. and Ga. Coke, No. 2 Foundry	17 00@18 00
Tenn., Ala. and Ga. Coke, Gray Forge	15 00@16 00
Charcoal or Coke, white and mottled	14 00@15 00
Tenn., Ala. and Ga. Cold Blast (car wheel)	22 00@28 00
Old rails	18 00@19 00
Old car wheels	16 00@17 00
Wrought scrap,	
No. 1	17 00
Wrought scrap,	
No. 2	12 00
Cast scrap	10 00
Muck bar	32 00@33 00

Iron Ores.

Red Hematite (about 55 per cent. metallic iron) f. o. c. at mines	1 25
Brown Hematite (about 55 per cent. metallic iron)	1 75

Cleveland, O. Oct. 19, 1877.

Specially reported by Messrs. C. E. BINGHAM & Co.

Per gross ton, on four months' time. Subject to change in market. Discount for cash 4 per cent.

FOUNDRY IRON.

No. 1, L. S. Charcoal	$25 00	Am. S., No. 1, Ch Val.	$23 00
No. 2, " " "	25 00	" " B. 1, " "	22 00
No. 1, Anthracite	23 00	" " No. 2, " "	20 00
No. 2, "	21 00	No. 1, Massillon	23 00
No. 1, Bituminous	23 00	B—1, "	22 00
No. 2, "	21 00	No. 2, "	20 00

CAR WHEEL AND MALLEABLE IRON.

No. 3 L. S. Charcoal	26 00	No. 5 & 6, L. S. Charcoal	$27 00
No. 4, " " "	26 00		

BESSEMER IRON.

Nos. 1 & 2, L. S. Char.	$25 00		

FORGE IRON.

No. 1, Gray	$19 00	White and Mottled	$18 00

Cincinnati, O. Oct 23, 1877.

Specially reported by Messrs. TRABER & AUBERY, commission merchants for the sale of pig iron, blooms, ore, etc.

CHARCOAL.

Hanging Rock No. 1 Foundry and B 1		$23 00@23 50	—4 mos
" No. 2 "		22 00@	—4 mos
" Soft Silver Gray		21 00@22 00	—4 mos
" Mill		18 00@20 00	—4 mos
Tennessee, No. 1 Foundry		22 00@	—4 mos
" " 2 "		21 00@	—4 mos
" Mill		19 00@	—4 mos

STONE COAL.

Ohio, No. 1 Foundry		20 00@20 50	—4 mos
" " 2 "		19 00@19 50	—4 mos
" " 3 "		18 00@18 50	—4 mos
" Mill		18 00@18 50	—4 mos

COKE.

Ohio & W. Va. No. 1 Foundry		21 00@22 00	—4 mos
" " " 2 "		20 00@21 00	—4 mos
" " Mill		18 00@19 00	—4 mos

CAR-WHEEL.

Hanging Rock, C. B.	Hecla, Vesuvius, Jefferson, Etna.	40 00@	—4 mos
Maryland, "	Amherst & Cedar Pt.	37 00@	—4 mos
Missouri, "	Maramec	32 00@	—4 mos
Alabama, "	Woodstock	32 00@	—4 mos

BLOOMS.

Charcoal		45 00@50 00	—cash.

SCRAP IRON.

Cast		40c.@ 45c.	— "
Wrought		62c.@ 1 00	— "

Louisville, Ky. Oct. 23, 1877.

Specially reported by Messrs. GEORGE H. HULL & Co.

Business active in all grades, but prices continue unchanged, with no prospect of an early improvement. The usual time, four months, is allowed on the quotations below.

FOUNDRY IRONS.

No. 1 Hanging Rock, Charcoal	$23 00@24 00
No. 2 " " "	20 00@21 00
No. 1 Southern Charcoal	20 00@21 00
No. 2 " "	19 00@20 00
No. 1 Hanging Rock, Stonecoal and Coke	20 00@22 00
No. 2 " " " "	19 00@20 00
No. 1 Southern Stonecoal and Coke	19 00@20 00
No. 2 " " " "	18 00@19 00
"American Scotch"	20 00@22 00
Silver Gray	18 00@19 00

MILL IRONS.

No. 1 Charcoal, Cold-short and Neutral	18 50@19 50
No. 1 Stonecoal and Coke, Cold-short and Neutral	18 00@18 50
No. 2 " " " " " "	17 50@18 00
No. 1 Missouri and Indiana Red-short	21 00@22 00
White and Mottled, Cold-short and Neutral	15 00@16 00

CAR-WHEEL AND MALLEABLE IRON.

Hanging Rock, and Cold Blast	34 00@38 00
Alabama and Georgia "	25 00@33 00
Kentucky Cold-blast	25 00@23 00

Milwaukee, Wis. Oct. 23, 1877.

Specially reported by Messrs. R. P. ELMORE & Co.

Wholesale Price.

Charcoal Iron.

No. 1 Lake Superior per gross ton	$25 00—4 mos.
No. 2 " " "	24 00—4 mos.

Anthracite Iron.

No. 1 anthracite per gross ton	$25 00—4 mos.
No. 2 " " "	24000—4 mos.

Stone Coal & Coke.

Wholesale Price.

Warner's Am. Sc'th (Bk. Bend) per ton	$25 00@ —4 mos.
Soft Silvery per ton	22 00@23 00—4 mos.
Lake Superior and Lake Champlain ores	24 00@25 00—4 mos.
Sharpsville (Penn.) native ores	24 00@25 00—4 mos

Car Wheel.

LakeSuperior ores per ton	$25 00@27 00—4 mos

Philadelphia, Pa.

[Weekly Report of the Philadelphia Iron Market, furnished for THE ENGINEERING AND MINING JOURNAL, by JUSTICE COX, Jr., & Co., Iron Merchants, 313 Walnut Street, Philadelphia, Week ending Oct. 25, 1877.]

PIG IRON.—We can hardly quote our market as firm as at our last. There is more anxiety to sell, yet we do not hear of any sales at less than quoted prices. We report sales of about 2,000 tons, and quote No. 1, $18.50@$20; No. 2, $17@$19; gray forge, $16@$18.

MANUFACTURED IRON.—Bars continue dull and depressed, and are quoted at 2 to 2 1-10c. per lb. for best refined; whilst common can be bought for almost

any price. Plate and tank are continued to be quoted in good demand at 2⅞ to 6½c. per lb. Skelp is quoted dull at 2½ to 2¼c. per lb.

RAILS.—Steel rails are in good demand at last week's quotations, but do not hear of any sales at an advance. The iron rail mills running have about all they can do at full quoted prices. We quote steel rails $45@$50; iron, $30@$35; all at mills.

OLD RAILS continue in good demand at advancing prices. We quote $19@$20, firm.

OLD WHEELS are crowding on the market, without takers at $17@$18.

SCRAP continues dull, with few inquiries at any price. We quote wrought, $20@$26; cast, $10@$16.

Pittsburgh, Pa. Oct. 23, 1877.

Specially reported by A. H. CHILDS.

The metal market is quiet with a fair demand for current wants. The large lots which were being pressed upon the market during the past few weeks have now been sold at such concessions as could be agreed upon or withdrawn, and prices are firm at the following quotations :

	4 mos.		4 mos.
No. 1 F'dry	$21 00@22 00	Mottled&White	$16 50@18 00
" 2 "	20 00@21 00	Hot blast C'coal	21 00@25 00
Gray Forge	18 00@20 50	Cold " Western	38 00@40 00

Richmond, Va. Oct. 23, 1877.

Specially reported by ASA SNYDER, Esq.

Virginia Cold Blast Charcoal Pig Iron, cold short			$20 to $26
" " " " " neutral			28 to 31
" Warm " " " "			20 to 25
" Anthracite	1 X		20 to 22
" "	2 X		19 to 21
" "	2		18 to 19
" " Coke West Va.	1 X		22 to 23
	X2		21 to 22

San Francisco, Cal.

From the *Commercial Herald* of Oct. 18, 1877.

The steamer Granada for Panama carried en route for New York 560,000 lbs. Pig Lead. The ship H. S. Gregory for Liverpool carried 82 cs. Yellow Metal. The general market is dull and sluggish for all articles in this line, and quotations remain largely nominal, with no transactions of moment to record. The steamship Australia brought from Sydney 98 ingots Tin.

St. Louis, Mo. Oct. 23, 1877.

Specially reported by Messrs. SPOONER & COLLINS, Commission Agents for all kinds of Iron.

COLD BLAST CHARCOAL—ALL NUMBERS.

Hanging Rock	25@38	Assorted Bar Iron	$2, rates.
Tennessee	26@30	No. 1 Wrought Scrap	80c. cwt.
Kentucky	26@30	Heavy cast "	65 "
Missouri	26@30	Light "	55 "
Georgia	26@30	Old rails	19 00 to 20 00
Alabama	26@30	Old car wheels	17 00 to 18 00

	No. 1.	No. 2.	Mill.	White and Mottl'd.
Missouri stone coal	$22 00	$21 00	$20 00	19 00
" charcoal	22 00	21 00	20 00	20 00
Tennessee charcoal	22 50	21 00	20 00	19 00
Tenn. coke very soft and strong	23 00	21 00	20 00	18 50
Hanging Rock charcoal	25 00	24 00	23 00	.....
" " cold short	24 00	23 00	.....	.....
	Ex No.1	No. 1.	B No. 1.	No. 2.
Alice Hanging Rock coke	$25 00	$24 50	$24 00	$22 50
Quinnimount, W.Va., coke	23 50	23 00	22 00	21 00

METALS.

NEW YORK, FRIDAY EVENING, Oct. 26, 1877.

The quantity of business doing is not so great as it was several weeks back. Some of the articles are exceedingly quiet, although values are, as a rule, pretty well maintained.

Gold Coin.—During the week under review the price of gold has ranged from 103 to 102¾, and closed at 102¾.

Bullion.—The London market advanced early in the week, but has receded since, and is to-day nominal at 55 3-16d. Germany has continued her weekly sales in London. We quote here at 119½@119¾, and in San Francisco, 9 per cent. discount.

Daily Range of Silver in London and New York per oz

Date.	London. Pence	New York. Cents	Date.	London. Pence	New York. Cents
Oct. 20	55	119¾	Oct. 24	55⅜	120¼
" 22	55 3-16	120	" 25	55⅛	119⅞
" 23	55⅛	120	" 9	55 3-16	119¾

BULLION SHIPMENTS.

We give below a statement showing the amount of the latest bullion shipments, in addition to that announced in our issue of Oct. 20 :

Date.	Mine.	Location.	Amount.
Sept.	California	Nevada.	† 1,535,890 37
"	Con. Virginia	"	‡ 1,342,248 01
"	Justice	"	220,969 00
Oct. 5	Northern Belle	"	13,100 00
" "	Standard	"	153,732 77

† Gold, 743,615 56 Silver, $792,274 81.
‡ Gold, $616,180. Silver, $726,026.
The productions given above of the California, Consolidated Virginia, and Justice, are for the fiscal month of September.

Cause for the Recent Rise in the Price of Silver.—The director of the mint is in receipt of information that the recent rise in the price of silver was due to famine in certain districts of India, for which large quantities of rice were procured directly from Siam, and silver sent there in payment, which silver came from London, where the general government freely supplied it.

San Francisco Silver Exports to Asia.—The export of silver from San Francisco to Asia during the first seven months of 1877, according to the figures reported from the Bureau of Statistics at Washington, amounted to $12,193,537, against $4,919,062 for a similar period in 1876. The silver exports for 1877 include, $1,783,372 of foreign silver coin and bullion (principally Mexican dollars), against $1,032,915 for the same months in 1876. It is only within the past year that silver has been shipped from San Francisco direct to Asia on London orders.

The Nevada and California Yields of Precious Metals for 1877.—Official reports received at the Treasury Department estimate that the yield of the precious metals in Nevada and California will amount during the present calendar year to $33,000,000 in gold and $27,000,000 in silver, as follows: Mines of the Comstock Lode, $20,000,000 in silver, and $17,000,000 in gold; remainder of the State of Nevada, $6,000,000 in silver, and $1,000,000 in gold; the State of California, $15,000,000 in gold and $1,000,000 in silver.

The Production of the Chilian Mines.—We note the statement that the total production of the Chilian mines from 1844 to 1874, amounted to $386,109,761, of which $225,993,592 were exported through the ports of the province of Atacama alone. In 1874 Atacama employed 1655 miners, working in 86 mines, and producing 16,207,926 kilogrammes (about 38,000,000 pounds) of silver mineral. In the province of Coquimbo the 340 mines of copper, silver, cobalt, mercury, and gold have given a gross product of 357,203,361 pounds, or a net production of 905 ounces of gold, 14,370 grammes of silver, and 21,643,600 kilogrammes of copper. There were 30 steam engines used, and 8,415 workmen employed.

The Trade Dollar Coinage.—A despatch from Washington, dated the 25th inst., says : "Respecting the order recently issued intermitting the receipts at the mints of deposits of silver for coinage into trade dollars, the Director of the Mint states that the only export demand for trade dollars at present is at San Francisco, where, probably, $800,000 per month are required for that purpose, to meet which requirement the brokers and bullion dealers in that city hold from $1,500,000 to $2,000,000; and, in addition to this stock, the mint in that city has on hand about $1,400,000. He states further that, since the order was issued, the mint at Philadelphia has been coining deposits made for trade dollars before the order was issued to the amount of nearly $500,000, and that, in the last few months, about 2,000,000 of trade dollars have gone into circulation in the Atlantic and Western States, and to that extent occupy the place intended by law to be filled by the fractional silver coins; and that the Government has been deprived of the seigniorage which it would otherwise have received. The Director states that, if there has been any mistake, it was in not sooner issuing the order.

Copper.—Outside of a mere retail trade, which is always doing, there has been nothing done worthy of note. Sales are reported at 17¾, which is now bid, with 17⅞c asked. Futures up to the opening of navigation in 1878 are quoted at 18½c. Best selected in London is quoted at £72 10s, a decline of 10s, and Chili Bars at £66.

Tin.—Straits in London is quoted to-day at £69 10s, with a rising tendency. There are reports of considerable business in Straits to arrive at 15¾c, and on spot at 16@16¼c. We, however, fail to authenticate an aggregate of more than 1,200 or 1,300 slabs. We quote here at 16@16¼c. gold. L. & F. in London is quoted at £74 10s, and in this market at 15½c, gold. Refined is quoted at 15¾@16c, and Banca 18c, gold, per lb.

Tin Plates.—There is but little doing in these. We quote in gold per box as follows: Charcoal tins, $6,50@6.62½, and ternes, $6.12½; coke tins, $5.62½, and ternes $5.50.

Messrs. Robert Crooks & Co., of Liverpool, under date of Oct. 11 say of tin and terne plates:

"This week several round orders have quite filled for next two months, two or three of the more popular brands of Coke Tins, but these operations have only affected particular makes and not the market as a whole, lowest prices touched being quite workable if only a good range of brands be given to select from. Charcoal Tins are miserably weak for all kinds, from the poorest to the heaviest stamping plates. Ternes have still sufficient demand to maintain prices."

Lead.—We note sales of 300 to 400 tons of lead at 4¼@4.35c. Since this business was done, the market has been generally quoted at 4.35 to 4⅛c., according quantity. We note further shipments by steamer, from San Francisco for this city, of about 250 tons.

Spelter and Zinc.—There is but very little doing in spelter, which is quoted from 5.70 to 6c. Sheet zinc is also quiet, and quoted at 7⅛c.

Antimony.—With but little business, Cookson's is quoted at 13¼ to 13½c. gold, and other brands 12⅛ to 12¼c. gold.

Quicksilver.—The San Francisco *Commercial Herald* of Oct. 18, says: The market is very sluggish and prices more or less nominal—say 45@46c. The Granada carried to Panama en route to Callao 550 flasks; to Arica, Peru, 50 flasks; also for Mexican ports 261 flasks.

The Quicksilver exports by sea for the past week are as follows :

	Flasks.	*Value.*
To Hongkong, per China, Oct. 11th—Yee Shung Tong & Co.	140	$4,820
Hip Wo & Co.	100	4,000
Wing Wo Sang & Co.	100	4,300
To Callao, per Granada, Oct. 15th—Thos. Bell	200	7,344
Hellmann Bros & Co.	350	11,812
To Arica, Peru, per Granada, Oct. 15th—Hellmann Bros. & Co.	50	1,688
To Mexico, per Granada, Oct. 15th—Thos. Bell.	110	4,039
I. Gutte	100	3,443
W. Loaiza	50	1,650
M. Vuliewich	1	38
Totals	1,201	$43,134

Receipts for the week, 1639 flasks.

Salt Lake Ore and Metal Market.

SALT LAKE CITY, UTAH, October 26, 1877.

Argentiferous Lead (Base Bullion).—$40@42 per ton for lead; $1.17@$1.18 per ounce for silver; $20 per ounce for gold. The quotations for silver are based upon the silver contents in the lead of 80 to 120 ounces per ton of 2,000 lb.

The *Inter-Ocean* correspondent, under date of the 18th inst., says : "There is a sale of four cars of bullion to report at $38 for lead and $1.17 for silver, the lowest price still that bullion was ever sold for in this market. In fact, this should not be set down as the market, as it was a forced sale, and a lot that was en-route on demurrage. The shipments for the week ending Oct. 13 of ore and bullion were as follows: Bullion—To Pittsburg, 22 cars; to New York, 8 cars; to Omaha, 2 cars; to St. Louis, 1 car; to Chicago, 3 cars. Lead Ore—To Omaha, 2 cars; to Hilliard, 18 cars. Bullion, 758,195 lbs; lead ore, 415,540 lbs. Total, 1,173,735 lbs." Mr. J. B. Meader, under date of the 20th inst., reports the following shipments:

Shipments of base bullion for September		3,258,360 lbs.
Shipments of base bullion for 8 months		32,931,895 "
Total for 9 months		36,190,255 lbs.
Ore shipments for September reduced to lead	492,926	
Ore shipments for 8 months	5,156,338	5,649,264 lbs.
Total shipments of lead for 9 months		41,839,519 lbs.

FINANCIAL.

New York Stocks.

NEW YORK, Friday Evening, October 26, 1877.

The dealings in the coal shares were smaller for the past week than for several of its predecessors. On Wednesday the Delaware, Lackawana & Western Railroad Company sold at public auction 125,000 tons of coal at prices much lower than had been anticipated, by nearly everyone. With all the advantages that existed for maintaining prices a very unsatisfactory business outlook is indicated for the companies during the winter; yet in the face of this the shares have had a rising tendency. This, however, only shows more clearly that the values represented in Wall street are entirely the result of manipulation, and is another warning to those who would use their judgment as a basis of operation there. The sales of Delaware, Lackawana & Western Railroad have aggregated 149,959 shares at 49⅛@52½, closing at 52. Delaware & Hudson has ranged between 41½ and 46⅞, closing at 46⅛. The sales of New Jersey Central Railroad have only amounted to 595 shares at 16½@17¼, closing at 16¾.

Delaware and Hudson Canal Company.—It is reported that the whole of the recent mortgage of the Delaware and Hudson not reserved to cover the $1,500,000 bonds due Nov. 1st, and the $3,300,000 reserved to cover a mortgage of the same class, hereafter due, has been taken, $5,000,000 in amount, by a syndicate of the directors of the company, Messrs. Astor, Kennedy and Pierpont Morgan.

The reported price at which the bonds were taken is 90 cents on the dollar, realizing therefore, to the company $4,500,000, for the loan.

Philadelphia Stocks.

PHILADELPHIA, Oct. 26, 1877.

The business in the coal shares of this market has been but moderate. In Pennsylvania Railroad the dealings have amounted to 35,501 shares of 29@29⅞. Reading has been fairly steady, fluctuating between 16⅛@15¼, with sales of 8,352 shares. Both Lehigh Coal and Nav. Co. & Lehigh Valley Railroad have weakened since the middle of the week, although the transactions have been very small.

Pennsylvania Salt Manufacturing Company.—25 shares of the stock of this company were sold at auction during the week at $64 per share.

Charleston (S. C.) Mining and Manufacturing Co.—50 shares of the stock of this Co. were sold at auction during the week at $40 per share.

The Buck Mountain Coal Co. has declared a dividend of $1.50 per share, payable Nov. 12.

The United Companies of New Jersey.—Regarding the recent depression in the shares of the United Companies of New Jersey, and the uneasy feeling engendered by the rumors affecting the legality of the lease of the lines to the Pennsylvania Railroad, the Philadelphia *Ledger* says:

"Notwithstanding there are some idle reports on the street in reference to the lease of the United Companies of New Jersey to the Pennsylvania Railroad Company, the most of them are so transparently absurd that we invariably discard them from consideration. It is to be regretted that any respectable paper should give them place in print, as they but further frighten the timid to forced sales of their stock when there are few or no buyers. The loss to holders that has been occasioned in this way amounts to hundreds of thousands of dollars. The first wrong was the blunder of a bill filed for an injunction, which, by a seeming smart trick, designed by unauthorized action to save to the Pennsylvania Railroad Company the payment of a quarterly dividend. Apprehension once aroused, even the most improbable rumors serve to keep it up."

"At a meeting of the Board of Directors of the United New Jersey Railroad and Canal Company, held at Trenton, N. J., October 20, the following resolutions were adopted:

"*Resolved*, That careful consideration by this Board of the proceedings lately instituted in the courts of New Jersey and Pennsylvania leads it to assure the stockholders that, in its belief, no basis exists for any well-founded apprehension that their rights can be impaired if properly defended.

"*Resolved*, That the counsel of this company be instructed to protect the interests and rights of the stockholders."

Mr. W. J. Howard, Solicitor of the Pennsylvania Railroad, tendered his resignation on the 25th inst., owing, it is believed, to the directors disapproving his action in instituting the recent proceedings restraining the Pennsylvania Railroad from paying a dividend on the United Railways of New Jersey. The resignation has not yet been accepted, and will be referred to a committee of the directors.

The stock of the United Companies continues to decline, the closing bid quotation, to-day, of 113, being $5 per share below the price of a week ago.

Miscellaneous Sales and Quotations.

Sales and quotations of the stocks and bonds dealt in here at Philadelphia, and Baltimore for the week ending the 26th inst. are given in the following tables. The Philadelphia quotations will have a * affixed. The Baltimore quotations are indicated thus †.

STOCKS.

	Quotations.—Highest.	Lowest.	Closing.	Sales Shares
American Coal Co	—	—	35	—
*Cambria Iron Co	—	—	50	—
*Pennsylvania Salt Manf'g Co.	—	—	65	—
*Westmoreland Coal Co	—	—	62	—
*Buck Mountain Coal Co	—	—	25	—
*Schuylkill Nav. Co	—	—	—	—
St. Louis, I. M. & S. RR. Co	—	—	8	1.00
Spring Mountain Coal Co	—	—	30	—
†Balt. & Ohio RR. Co. pref	—	—	—	—
" " common	—	—	100	53
†Pittsburg & Connellsville RR.	—	—	—	—
†George's Creek Coal Co	—	—	95	—
†Santa Clara Mining Co	—	—	8¼	—
†Atlantic Coal Co	—	—	1.35	—

BONDS.

D., L. & W. 7s, Convt., 1892	J. & D.	—	—	—	—
" " 2d mtge., 1881	M. & S.	—	—	104¼	—
N. J. C., 1st mtge., new	F. & A.	109¾	109½	109	$6,000
" " 1st mt., cons. 1899	Q.	66¼	66⅛	66¼	7,000
" " Convt	M. & N.	63¼	—	63	5,000
L. & W. B. Coal Co., cons.	Q.	34	33	33¼	6,000
A. n. Dock & Imp. 7s	J. & J.	—	—	—	—
D. & H. C. Co., 1st m., 1884	J. & J.	98½	—	98	9,000
" " " " 1891	J. & J.	100½	—	—	19,100
" " " " 1877	J. & J.	—	—	103⅛	—
" " " " reg., 1894	A. & O.	—	—	—	—
" " " " coup., 1894	A. & O.	—	—	—	—
St. L. I. M. & S., 1st mt. 1892	F. & A.	98	97⅝	98	7,000
C. ies. & Ohio, 1st mt., 1899	—	—	—	25⅛	—
*L. V. RR., con. m. 6s, 1923	J. & D.	99	98	98⅛	13,000
" " 2d m., 7s, 1910	M. & S.	112½	—	112½	3,000
" " reg., 1898	J. & D.	—	—	—	—
" " coup., 18,8	J. & D.	109⅛	—	—	1,000
*L. RR., 1st mtge., 1880	J. & J.	106	—	—	4,000
" Gen. mtge. reg., 1910	A. & O.	—	—	—	—
" Con. m. 6s. cou.. 1905	J. & D.	93	—	92⅛	1,000
" " " reg. 1905	Q.	93	—	92⅛	2,000
" gen M. Coup., 1910	J. & J.	100	—	106	8,900
" New Loan 5s	—	108¾	107¾	—	14,450
*P. & R. RR., 7s, 1893	A. & O.	—	—	—	—
" " con. m. 7s. cou. 1911	J. & D.	—	—	—	—
" " Deb. 6s, 1893	J. & J.	45	—	—	1,000
" " New convt. 7s. 1893	J. & J.	60	—	57	10,000
" " Con. mtge. 7s. reg.	J. & D.	102½	—	101⅜	2,000
" " 6s, 44-80 1880	J. & J.	—	—	—	—
*P. & R. C. & I. Co. Deb. 7s	M. & S.	—	—	—	—
*P. & R. C. & I. Co	—	*65	*61	—	8,000
*L. C. & N. Co. 6s. 1884	M. & Q.	105¼	104¼	103½	1,400
" " RR. loan 1897	F. & Q.	—	—	—	—
" " Con. mtge. 7s.	J. & D.	—	—	—	—
" " Cvt. gold, 1894	M. & S.	—	—	—	—
" " Gold Loan, 1897	J. & D.	89	81½	88½	2,000
Schuylkill Nav., 6s. 1897	M & Q.	—	—	—	—
Pa. and N. Y. Canal, 7s ..	J. & D.	—	—	109½	—
Pa. Canal Co	J. & J.	—	—	—	—
Susquehanna Coal Co. 6s.	—	60	—	—	8,000
Ches. & Ohio 1st m. 6s..	M. & N.	—	—	103	1,000
Balt. & Ohio 6s. 1885	J. & J.	125	—	103	1,000
" " 6s. 1885	A. & O.	104	—	102	7,500

Total transactions for the week.....$146,350

* Auction sales.

Copper Stocks.

Reported by Wilson W. Fay & Co., Bankers and Brokers Room 7, Traveler Building, 31 State Street.

BOSTON, THURSDAY EVENING, Oct. 25, 1877.

There is no change in the state of the market; it retains its dullness without any special features of interest except an unusual number of transactions in Calumet and Hecla, and an unusual lack of transactions in any of the other coppers. The state of the ingot copper market is certainly having a very unfavorable effect upon the stocks, but it seems as though a small amount of money invested in some of the stocks of actual worth, which are at present at such low figures, would certainly pay a good interest and possibly double itself upon a rise in the price of copper.

Calumet and Hecla Mining Company have declared a dividend of $5 per share, payable Nov. 15th, 1877, to stockholders of record Oct. 20, 1877. The stock closes strong at 173¼@173¾.

Copper Falls is quiet and weak at 3@3¼.

Franklin is also quiet and weak, there being scarcely a bidder for it, and offered freely at 7·00; it closes 6·00@7.00.

No news yet of the assessment on National; it is reported that the committee disagree as to the amount per share to assess. The stock is now .10@.15.

Osceola has fallen off a little and is now 17.00 bid and 19.00 asked.

Quincy dropped a peg during the week but rallied again and is now firm at 38½@39¼.

Ridge has strengthened somewhat and closes at 1¾@1⅞.

The other coppers are quiet and unchanged.

Duncan silver spurted to-day, as we predicted last week, and sold at 1¾, and is now firm at 1⅝@1¾.

International is quiet and rather weak, closing at .22@.25.

Gold and Silver Stocks.

NEW YORK, Friday Evening, Oct. 26, 1877.

American Flag, Moose and Lacrosse have been the principal features in the operations of the New York Mining Stock Exchange during the week under review. The dealings in these three stocks comprise over one-half of the transactions of the Board. Bertha & Edith has ranged from 10 cents to 4 cents per share, with transactions amounting to 8,800 shares. Merrimac has declined to $3, on a sale of but 100 shares for the week. Ontario has had a rising tendency, with sales of 1,950 shares. The San Francisco stocks have received but little attention in this market: the quotations of these, however, generally showing a decline. Seaton has had a weakening tendency, under rumors of an indebtedness against the property.

On the regular Board there has been an active business in the Quicksilver stocks. The sales of preferred have amounted to 9,550 shares, at $34½ @ $43. In the common stock the transactions have been 2,900 shares, at $20¼ @ $17½.

MINING STOCK QUOTATIONS IN SAN FRANCISCO.

We give below a table showing the closing price of mining shares in San Francisco yesterday, 25th inst.

Alpha	14	Mexican	11
Belcher	6	Northern Belle	15⅝
Best & Belcher	22	Ophir	17
Bullion	11	Original Comstock	..
Caledonia	4	Overman	20
California	31	Raymond & Ely	9
Challar Potosi	34	Santiago	..
Con. Imperial	1	Savage	10
Con. Virginia	31	Seg. Belcher	37
Confidence	7	Sierra Nevada	5
Crown Point	6	Silver City	..
Eureka	44	Silver Hill	3
Exchequer	11	South Comstock	..
Gould & Curry	10	South California	..
Hale & Norcross	8	Southern Star	..
Indian Queen	..	Trenton	..
Julia	3	Union Con	7
Justice	13	West Belcher	..
Kentuck	7	Yellow Jacket	10
Kossuth	..	Young America	..
Leopard	1		

The San Francisco *Commercial-Herald* of the 19th inst. says of the market: "The closing of a number of small and unreliable savings banks—only so in name—have had the effect to lighten the money market to a marked extent, and thereby more or less restricting mining stock operations, because of the precautionary steps taken by all monetary institutions on such occasions to be prepared for any emergency. Prices of mining stocks, however, under the circumstances have been well maintained, and the recent line of sales of outside stocks in large quantities has been vigorously prosecuted. This interest has been a quite fortunate one for the stock jobbers' trade at this time, when no strong movement in the usual class that participate was apparent and is even not a very assured thing in the near future, though we are constantly told that a "move" would surely take place soon. The move has certainly been inaugurated in outside stocks, and it may extend to the general list, but the present is an unpropitious time, when confidence in monetary circles is so much shaken. Sales in the San Francisco Board have been half a million less than the previous week.

October Assessments.—The total sum levied by the mines of the Pacific Coast delinquent during the present month, amounts to $1,234,467, divided among 36 mines, of which 21 are in the State of Nevada, 13 in California, and 1 in Utah.

EUREKA CONSOLIDATED SILVER MINING CO.—(ANNUAL REPORT). The *San Francisco Stock Report* of the 19th inst. says: "The annual meeting of this company was held yesterday. The superintendent makes the following report: During the past year 24,968 tons of ore were extracted, 4,180 feet of drifts run, and 1,685 feet of winzes sunk. The 5th, 6th, 7th, 8th and 9th levels were extended to the west line. Winzes have been sunk 200 feet below the 9th level, making a total depth of 930 feet from the surface. Large bodies of ore have been found near the west line, extending from the 5th level to the bottom of the winze below the 10th level, a distance of 900 feet on the dip of the vein, exposing an amount of ore sufficient to keep the furnaces running to their full capacity for at least a year. A large and valuable body of ore has also been developed by the Richmond on our 10th level (while the lawsuit was pending), which adds materially to the value of the property. Nearly all the ore found in the mine up to the present time has been on or near the foot-wall, and no prospecting has been done toward the hanging-wall, except on the 9th and 10th levels, which leaves a large portion of the mine unprospected, in which, I think, we may reasonably expect to find valuable deposits of ore. The machinery in the mine is all in first-class order, and also the furnaces.

Following is the Secretary's report of receipts and disbursements:

RECEIPTS.

From 1211 tons bullion (refined)	$439,742 23
Sale railroad cars, locomotives, etc.	75,000 00
Sale flue dust	7,199 35
Sale wood	617 75
Sale Scales	415 50
Sale old iron, etc.	1,181 35
Advances on bullion shipments	635,000 00
Balance in hands of Superintendent	286 66
Cash in office	135 17
Superintendent's drafts outstanding	11,908 37
Bills for supplies (not due)	5,553 40
Total	$1,177,039 78

DISBURSEMENTS.

Mine Account—		
Labor at mine	$145,462 48	
Timber and lumber	23,059 23	
Hauling ores	12,019 07	
Wood and coal	12,558 31	
Purchase of ores	19,585 97	
Sundries	22,370 96—	$235.956 02
Smelting Account—		
For labor	$57,145 66	
Charcoal	206,415 55	
Sundries	27,177 86—	$290,739 07
General expenses		24,724 54
Expenses San Francisco		9,125 13
Bills payable		50,000 00
Freight, refining, etc		172,583 51
Legal expenses		91,557 41
Dividend		150,000 00
J. & W. Selligman advances on bullion		75,000 00
Anglo-California Bank		41,781 00
Book account		1,908 64
Superintendent's drafts		3,603 62
In hands of Superintendent		319 60
Balance cash on hand		25,062 15
Total		$1,177,039 78

According to the Eureka *Sentinel*, the present daily shipments of this mine amount to about seventy-five tons, and the quantity will soon be increased by the product of two more furnaces. The value of the gold and silver contained in the metal bars thus shipped is estimated at $630,000 per month, while that of the lead is placed at $110,000. The company employs about 160 miners and 100 furnace-men.

Sutro Tunnel.—The Gold Hill *News* of the 17th inst. says: "The face of the header in this work continues in soft ledge matter, consisting of vein porphyry, quartz and clay, requiring close and constant timbering and allowing of very slow advancement. The tunnel being now over 18,000 feet in length, it is evidently into the eastern outskirts of the Comstock, and can soon be made available for drainage. An important meeting of the various mining superintendents of the Comstock was held on the 16th inst., at Virginia, a committee was appointed to ascertain the exact cost of pumping or draining the water from the various mines of the Comstock from the level of the Sutro Tunnel to the surface, a distance of 1,650 feet or thereabouts; also the cost of pumping up to the level of the tunnel; and, in short, ascertain just what the companies can afford to pay for the privilege of allowing the water to flow out through the tunnel. They are to report to a similar committee already appointed in San Francisco of the mining men there, and the result will be a proposal to the Sutro Tunnel Company.

"It has been ascertained definitely that the Sutro Tunnel will not tap the Comstock at so great a depth as has been heretofore represented, by about 100 feet. There are also many other points of interest relative to it, which will be shortly brought to light. The result of this action by the mine owners and managements will be a compromise advantageous to all concerned. The royalty proposition will be ignored and abandoned, and the basis of the compromise will be the actual cost of pumping the water to the surface, above the level of the Tunnel.

QUICKSILVER MINING COMPANY.—The Supreme Court, General Term, Chief Justice Davis and Judges Brady and Daniels being on the bench, gave, 25th inst., the final judgment in the case of George L. Kent against this company. In this decision the Court clearly upholds the preferred stock, and declares its holders to be entitled to receive out of the net earnings of the company seven per cent. interest since the 1st of May, 1870. The judgment also enjoins the company and its directors from doing or procuring any

COAL TRANSPORTATION AND GENERAL MINING STOCKS.

Name and Location of Company.		Feet on Vein.	Capital Stock	Shares		Assessments.				Dividends.					Highest and Lowest Quotations per Share in Currency.												Sales.
				No.	Par Val.	Total levied to date.	Date and amount per share of last.			Total paid to date.	Last Dividend.			Rate per Ann.	Oct. 20.		Oct. 22.		Oct. 23.		Oct. 24.		Oct. 25.		Oct. 26.		
															H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Coal Stocks.			$			$	Mo.	Yr.	Amt.	$	Mo.	Yr.	Amt.	Per cent.													
Consol. Coal	Md.	....	10,250,000	102,500	$100	*	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	21	....
Del. & H. Canal	Pa.	....	20,000,000	200,000	100	*	.....	.....	.....	38,821,104	Aug.	1876	4	8	43⅛	42½	42	41⅝	43¾	42⅜	45	43¼	46¾	44	46⅞	45½	17,904
Del., Lac. & W. RR.	Pa.	....	26,200,000	524,000	50	*	.....	.....	.....	.....	July	1876	2¾	5	52⅛	50½	51¾	49⅝	51½	50⅜	52¾	50	52⅛	50	52½	51⅛	149,959
Lehigh C. & N.	Pa.	....	10,448,550	208,971	50	*	.....	.....	.....	.. ..	Sep.	1876	1¾	6	18½	18¼	18	18	..	..	18¼	18⅛	..	..	17¾	17⅝	1,290
Lehigh Valley RR.	Pa.	....	27,042,900	540,858	50	*	.....	.....	.....	.....	Oct.	1877	1	5	39½	39¼	39⅜	39⅛	39⅜	39¼	40	39⅞	39¾	39¼	39	38⅞	361
Maryland Coal	Md.	....	4,600,000	44,000	100	*	.....	.....	.....	...	Jan.	1876	1½	1½	..	..	..	..	..	..	..	..	..	..	..	..	....
N. J. Central RR.	Pa.	....	20,600,000	206,000	100	*	.....	.....	.....	....	Apr.	1876	2½	10	..	..	17¼	17	..	..	16⅜	16½	17	16¾	17¼	16¾	595
Penna. Coal	Pa.	....	5,000,000	100,000	50	*	.....	.....	.....	....	Aug.	1877	3	12	..	..	..	..	..	..	..	..	..	..	..	..	....
Pennsylvania RR.	Pa.	....	68,868,700	1,377,376	50	*	.....	.....	.....	....	May.	1877	1½	10	29⅝	29⅜	29⅜	29	29⅜	29⅛	29⅜	29⅜	29⅞	29½	29⅜	29⅛	35,501
Phil. & Read. RR.	Pa.	....	34,278,755	685,575	50	*	.....	.....	.....	...	Jan.	1876	2½	..	16⅛	16	15¾	15½	15⅞	15⅜	15⅞	15¾	16	15⅝	15⅞	15½	8,352
General Mining Stocks																											
Alpha Cons. g. s.	Nev.	300	3,000,000	30,000	100	210,000	Aug.	1877	$1 00	....	.....	.....	.....	..	15½	..	15¾	..	15c	..	13¼	..	14¾	..	13⅜	13	600
Am. Flag, g.	Colo.	5,300	600,000	50,000	10	*	.....	.....	.....	....	.....	.....	.....	..	13c	..	13c	..	15c	13c	15c	14c	15c	14c	15c	13c	18,800
Belcher. g. s.	Nev.	1 040	10,400,000	104,000	100	1,072,400	Sept	1877	1 00	15,397,200	Apr.	1876	$1 00	12	6	..	6	..	6	..	5¾	..	5	..	5¾	..	900
Bertha & Edith G.	Vir.	645 acs.	3,500,000	350,000	10	*	.....	.....	.....	...	.....	.....	.....	..	..	..	8c	..	10c	7c	9c	7c	8c	4c	8c	..	8,800
Best and Belcher, g. s.	Nev.	545	10,080,000	100,800	100	337,792	Aug.	1877	1 00	....	.....	.....	.....	..	24¼	..	..	..	23½	..	..	..	..	..	..	..	200
Bobtail, g.	Colo.	2,500	1 136,630	227,326	5	*	.....	.....	.....	....	.....	.....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Bobtail Tunnel, g.	Colo.	....	100,000	20,000	5	6,000	July	1873	0 30	20,000	Dec.	1876	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Bullion, g. s.	Nev.	943½	10,000,000	100,000	100	2,702,000	Oct.	1877	1 50	....	.....	.....	.....	..	12	..	12¾	..	12	..	12	..	11¾	11¾	10½	..	1,200
Caledonia, g. s.	Nev.	2,188	10,000,000	100,000	100	1,435,000	Oct.	1877	75	....	.....	.....	.....	..	..	..	4⅛	..	4	..	3⅞	..	3⅝	..	3⅞	3½	700
California, g. s.	Nev.	600	54,000,000	540,000	100	....	.....	.....	.....	19,440,000	Oct.	1877	2 00	24	..	..	..	..	..	..	..	..	..	..	..	..	....
Choliar Potosi, g. s.	Nev.	1,400	2,800,000	28,000	100	1,496,000	Oct.	1877	3 00	3,080,000	Feb.	1872	1 00	12	..	..	37¾	..	..	..	..	..	..	..	..	..	100
Cleveland, g.	Colo.	3,715	250,000	25,000	10	*	.....	.....	.....	....	.....	.....	.....	..	5⅞	5½	..	..	..	..	5¾	..	..	..	5½	..	1,400
Cons. Hercules & Roe.	Colo.	16,500	1,000,000	100,000	10	*	.....	.....	.....	120,000	.....	.....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Cons. Imperial, g. s.	Nev.	468	50,000,000	500,000	100	475,000	May.	1877	0 20	....	.....	.....	.....	..	•	..	1	..	..	..	1⅛	1	..	..	..	..	700
Con. N. Slope & E. C. T.	Colo.	15,000	500,000	10,000	50	*	.....	.....	.....	....	.....	.....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Cons. Virginia, g. s.	Nev.	710	54,000,000	540,000	100	474,600	June	1873	3 00	33,480,000	Oct.	1877	2 00	24	..	..	..	..	..	..	30	..	..	..	..	..	25
Confidence, g. s.	Nev.	130	2,496,000	24,960	100	243,840	Mar.	1873	1 00	78,000	May.	1865	8 ⅓	..	6¾	..	6¾	6	6¾	6⅝	6¼	..	6¾	..	6¾	..	1,100
Crown Point, g. s.	Nev.	600	10,000,000	100,000	100	1,573,370	Sept.	1877	1 00	11,588,000	Jan.	1875	2 00	24	..	..	..	..	..	..	..	..	..	..	..	..	....
Douglas	Colo.	21,000	1,000,000	10,000	100	*	.....	.....	.....	....	.....	.....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Eureka Cons. g. s. l.	Nev.	..	5,000,000	50,000	100	100,000	May	1876	1 00	1,000,000	Aug.	1875	1 00	..	..	..	..	..	47¼	47	..	..	46	..	46	..	500
Eureka G. Mg. g.	Cal'f		2,000,000	20,000	100	.. ..	.....	.....	.....	2,134,000	Aug.	1877	2 00	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Exchequer, g. s.	Nev.	490	10,000,000	100,000	100	280,000	Sept.	1876	1 00	....	.....	.....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Gould and Curry, g. s.	Nev.	621	10,800,000	108,000	100	2,352,000	Aug.	1877	1 00	3,934,800	Oct.	1870	10 00	..	..	..	1 .¼	..	11	..	12	..	10¾	..	9½	..	600
Granville Gold	N. C.	9,000	1,000,000	100,000	10	*	.....	.....	0 50	....	.....	.....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Hale & Norcross, g. s.	Nev.	400	11,200,000	112,000	100	2,634,000	Oct.	1877	1 00	1,598,000	Apr.	1871	1 00	12	7⅞	7¾	7¾	..	..	..	7¼	..	7⅞	..	7	..	800
Henry Tunnel	Nev.	3,000	2,000,000	80,000	25	*	.....	.....	.....	....	.....	.....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Hukill, g. s.	Colo.	3,988	1,000,000	100,000	10	*	.....	.....	.....	9.,000	Oct.	1877	0 10	12	4⅜	..	4¾	4½	..	..	4½	4¾	4½	4¾	..	..	800
Indian Queen, s.	Nev.	1,000	3,000,000	60,000	100	.. ..	.....	.....	.....	60,000	Dec.	1875	0 50	..	3½	..	3¼	..	3⅛	..	..	..	..	..	2½	..	500
Julia Cons. g. s.	Nev.	3,000	11,000,000	110,000	100	440,000	Aug.	1877	1 00	...	.....	.....	.....	..	..	..	1 3¼	..	..	..	12½	13	..	..	..	..	500
Justice, g. s.	Nev.	2,100	10,500,000	105,000	100	1,817,500	Aug.	1877	1 50	....	.....	.....	.....	..	7¾	7½	8½	8	8½	..	..	..	7¾	..	7¾	7½	800
Kentuck, g. s.	Nev.	95	3,000,000	30,000	100	270,000	Dec.	1874	1 00	1,252,000	Mar.	1870	5 00	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Kossuth, g. s.	Nev.	2,700	5,400,000	108,000	50	421,200	Aug.	1877	0 15	....	.....	.....	.....	..	34c	32c	33c	32c	32c	..	52c	31c	33c	30c	31c	..	12,200
Lacrosse	Colo.	3,900	1,000,000	100,000	10	*	.....	.....	.....	....	.....	.....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Leopard, L. g. s.	Nev.	1,500	5,000,000	50,000	100	100,000	July	1877	50	162,500	Dec.	1876	0 50	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Lucerne Mining	Colo	4,200	5,000,000	500,000	10	*	.....	.....	.....	....	.....	.....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Mariposa, preferred	Cal.	44.387	5,000,000	50,000	100	1,425,000	June	1877	1 00	....	.....	.....	.....	..	..	..	1½	..	1⅜	..	..	..	..	..	..	..	400
" common	"	acres.	10,000,000	100,000	100	1,425,000	June	1877	1 00	....	.....	.....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Memphis	Colo.	6,000	300,000	60,000	5	*	.....	.....	.....	....	.....	.....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Merrimac, s.	Mass.	1,500	500,000	50,000	10	*	.....	.....	.....	85,000	Sept.	1877	40c	12	..	..	..	..	..	..	..	..	..	..	..	..	100
Mexican, g. s.	Nev.	600	10,080,000	100,800	100	181,440	Aug.	1877	0 30	...	.....	.....	.....	..	12¾	..	1 2¼	12	12	..	3	..	..	..	..	..	400
Moose	Colo.	39,000	2,000,000	200,000	10	....	.....	.....	.....	100,000	Oct.	1877	0 25	..	6	5¾	6	5⅞	6⅛	5⅞	6¼	6	6⅛	5⅛	5⅞	6¼	13,000
N. Y. & Colo., g.	Colo.		1,000,000	50,000	20	*	.....	.....	.....	20.000	Mar.	1877	0 20	..	2¼	2	2⅛	1¾	2	..	2	1⅞	2⅛	1⅞	2¼	2	3.700
Northern Belle, s.	Nev.	1,600	5,000,000	50,000	100	....	.....	.....	.....	1,400,000	Oct.	1877	1 00	..	..	..	..	..	..	..	16½	..	..	..	..	..	100
Ontario.	Utah	3,000	10,000,000	100,000	100	....	.....	.....	.....	550,000	Oct.	1877	50	6	23	..	2 3½	..	23½	..	23¾	23½	23¾	23⅛	23¼	..	1,950
Ophir, g. s.	Nev.	675	10,080,000	100,800	100	2,934,400	May.	1875	2 00	1,394,400	Mar.	1874	4 00	..	19	..	8¾	..	18¼	..	17	..	17⅛	..	16½	16¼	700
Original Comstock, g. s.	Nev.	.. ..	10,000,000	10,000	100	....	.....	.....	.....	....	.....	.....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Overman, g. s.	Nev.	1,200	3,840,000	38,400	100	2,452,680	June	1877	3 00	....	.....	.....	.....	..	2 3¼	..	2 ..	..	23	..	..	..	20⅜	..	..	..	700
Pleasant View, g.	Colo	1,200	200,000	20,000	10	*	.....	.....	.....	....	.....	.....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Quicksil. preferred	Cal.	8,500	4,291,300			*	.....	.....	.....	....	.....	.....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
" common	"	acres.	5,708,700	100,000	100	....	.....	.....	.....	....	.....	.....	.....	..	36	35	35¼	34⅜	35½	34¾	38	35⅞	41	37	43	40	9,550
Raymond and Ely, g. s.	Nev.	5,000	3,000,000	30,000	100	540,000	Dec.	1876	1 00	3,075,000	Sept.	1873	3 00	..	..	..	19	..	20¼	19	19	18⅞	18¼	18	17¾	17½	2,900
St. Joseph, L.	Mo.	2600 acs.	1,000,000	100,000	10	....	.....	.....	.....	250,000	.....	.....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Santiago, g. s.	Nev.	2,000	11,200,000	112,000	100	....	.....	.....	.....	....	.....	.....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Savage, g. s.	Nev.	800	11,200,000	112,000	100	3,408,500	Sept.	1877	1 00	4,460,000	June	1869	3 00	..	11⅜	..	..	..	10	..	..	..	10½	..	9¾	..	400
Seaton, g. s.	Colo.	1,700	500,000	50,000	10	*	.....	.....	.....	10,000	May.	1877	0 10	12	..	..	..	..	..	..	1.45	..	1.15	..	..	..	900
Seg. Belcher. g. s.	Nev.	160	640,000	6,400	100	244,800	Apr.	1876	5 00	....	.....	.....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Sierra Nevada g. s.	Nev.	3,650	10,000,000	100,000	100	1,750,000	Aug.	1877	0 50	....	Jan.	1871	1 00	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Silver City, g. s.	Nev.	3,900	6,310,000	63,100	100	15,775	Nev.	1876	0 25	....	.....	.....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Silver Hill, g. s.	Nev.	5,400	5,400,000	54,000	100	972,000	July.	1877	1 00	....	.....	.....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
South Comstock, g. s.	Nev.	1,500	10,000,000	100,000	100	54,000	Jan	1877	0 25	....	.....	.....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
South. California, g. s.	Nev.	1,500	5,000,000	50,000	100	....	.....	.....	.....	....	.....	.....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Southern Star. g. s.	Nev.	1,500	6,000,000	600,000	100	....	.....	.....	.....	....	.....	.....	.....	..	..	..	..	..	..	..	..	..	..	..	1½	..	100
Trenton, g. s.	Nev.	..	10,000,000	100,000	100	....	.....	.....	.....	....	.....	.....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Union Cons., g. s.	Nev.	850	10,000,000	100,000	100	260,000	Mar.	1876	1 00	....	.....	.....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
West Belcher, g. s.	Nev.	1,000	10,000,000	100,000	100	....	.....	.....	.....	....	.....	.....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Yellow Jacket, g. s.	Nev.	1,200	12,000,000	120,000	100	1,198,000	Sept.	1877	2 00	2,184,000	Aug.	1871	2 50	..	10¾	..	..	..	10½	..	..	..	..	..	..	..	200
Young America, s.	Nev.	1,000	3,000,000	30,000	100	6,000	Oct.	1876	0 20	...	.....	.....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Copper Stocks.																											
Allouez, c.	Mich.	..	1,000,000	20,000	50	940,000	May.	1876	5 00	....	.....	.....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Calumet & Hecla, c.	Mich.	..	2,000,000	80,000	25	1,200,000	.....	.....	.....	11,850,000	Aug.	1877	5 00	20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Central, c.	Mich.	..	500,000	20,000	25	100,000	June	1862	0 65	1,160,000	Feb.	1877	7 00	28	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Copper Falls, c.	Mich.	..	1,000,000	20,000	50	535,000	May.	1876	.....	100,000	Nov.	1871	1 00	..	..	..	..	..	..	..	..	..	..	..	..	..	.....
Dana, c.	Mich.	..	500,000	20,000	25	68,000	Jan.	1863	0 50	....	.....	.....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	.....
Dawson, s.	Ont.	..	1,200,000	60,000	20	....	.....	.....	.....	....	.....	.....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Duncan, s.	Ont.	..	1,200,000	60,000	20	75,000	July.	1876	41⅔	....	.....	.....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Franklin, c.	Mich.	..	500,000	20,000	25	360,000	June	1876	5 00	585,000	Nov.	1871	1 00	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Humboldt, c.	Mich.	..	500,000	20,000	25	100,000	Sept.	1876	0 15	....	.....	.....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
International, s.	Ont.	..	1,200,000	60,000	20	....	.....	.....	.....	....	.....	.....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Madison, c.	Mich.	..	500,000	20,000	25	123,000	Sept.	1876	0 10	....	.....	.....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mesnard, c.	Mich.	..	500,000	20,000	25	160,000	Apr.	1876	0 50	....	.....	.....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Minesota, c.	Mich.	..	1,000,000	20,000	50	436,000	June	1869	1 00	1,820,000	Mar.	1876	0 50	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
National, c.	Mich.	..	500,000	20,000	25	195,000	Oct.	1875	1 00	360,000	Oct.	1873	1 00	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Osceola, c.	Mich.	..	1,000,000	40,000	25	880,000	May.	1876	2 00	....	.....	.....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Petherick, c.	Mich.	..	500,000	20,000	25	165,533	Mar.	1876	0 50	....	.....	.....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Pewabic, c.	Mich.	..	500,000	20,000	25	185,000	June	1868	3 00	460 000	July	1873	1 00	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Phœnix, c.	Mich.	..	1,000,000	20,000	50	817,500	Sept.	1870	3 00	20,000	Jan.	1876	1 00	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Quincy, c.	Mich.	..	200,000	20,000	10	....	.....	.....	.....	2,130,000	Feb.	1877	4 00	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ridge, c.	Mich.	..	500,000	20,000	25	200,000	.....	.....	.....	90,000	Feb.	1873	1 00	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Rockland, c.	Mich.	..	500,000	20,000	25	495,000	Jan.	1874	1 00	....	.....	.....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Star, c.	Mich.	..	500,000	20,000	25	265,000	Mar.	1876	0 50	....	.....	.....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Superior, c.	Mich.	..	500,000	20,000	25	340,000	Mar.	1874	0 25	....	.....	.....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

g. Gold. s. Silver. L. Lead. c. Copper. * Non-Assessable.

Total Assessments levied to date	$46,781,310	Total Sales of coal stocks for the week	213,962 shares
Total Mining Dividends disbursed to date	125 806,084	Total Sales of Mining Shares for the week	82,490 do

act to be done which in any wise interferes with the rights of the preferred stockholders. Under this decision the preferred stock advanced to $43 per share at the opening of the market to-day, and closed at $40, with transactions aggregating 9,550 shares for the week. The common stock has slightly declined; the sales amounting to nearly 3,000 shares.

ASSESSMENTS.—Cosmopolitan Mining Co., 25 cents per share. Combination Mining Co. 10 cents per share. North Modoc Mining Co, 10 cents per share.

The American Mining and Stock Exchange.—Upon the application of William H. Barbour for the appointment of a receiver, Judge Donohue issued yesterday an injunction on the treasurer and other officers of the old organization of the American Mining and Stock Exchange from any further acts as officers. This step has been taken in the interest of both the old and new Consolidated Exchange, and to enable a receiver to legally close up the old organization, which is not an incorporated body. There is considerable cash on hand due from members, and this action simplifies matters considerably, the suit being a friendly one.

Gas Stocks.

NEW YORK, FRIDAY EVENING, Oct. 26, 1877.

We have but little change to note in the gas stock market, and no sales to report. The Manhattan Company has declared a dividend of 5 per cent.

The Gas Question in Philadelphia.—Considerable excitement now prevails in Philadelphia, growing out of a remark made at a recent meeting of the Common Council. The *Ledger* of the 22d says of this:

"Inquiries are being made concerning a remark made by Col. Charles Thompson Jones in Select Council on Thursday last, while speaking of the complaints from Manayunk and Roxborough, about the bad quality of the gas furnished those localities by the "Gas Trust." Among other things, Col. Jones is reported as having said that he wished Councils to know that 'one of the Gas Trustees has a patent used in Manayunk, and of course he does not care to give it up.' We were aware that a name which is also the name of a Gas Trustee was connected with a private speculation that promises to the citizens of Harrisburg gas at the reasonable rate of one dollar per thousand cubic feet; but were not aware that the operations carried on at Manayunk for a considerable time past were under the same patent. If we recall the facts correctly, the Manayunk operation is under F. S. Lowe's petroleum method: for which leave was granted for a trial there by independent gas-works. Professor Rogers, we think, was to have made a report about the matter. (We shall publish this report in full in our next issue.) It would be interesting to know whether he did report, and if so, what became of the document. The Gas Trustees are not famous for giving the public light on these interesting matters.

"Now, however, that Colonel Jones has opened up the subject in Councils, it must not be allowed to drop; and, in order to satisfy one of the inquiries above referred to, we publish in another column this morning the copy of a printed circular of the corporation which promises Harrisburg that great boon—gas at $1 per thousand feet. It will be seen that the circular bears the name of Nathan Hilles as Treasurer. It may be no more than a coincidence that this is also the name of the President of the Gas Trust of Philadelphia; but possibly the two officials may be the same person. If they are, it would be quite interesting to have information on this point; if Nathan Hilles, President of the Citizens' Gas Company, can furnish Harrisburg with gas at $1 a thousand, why can't Nathan Hilles, President of the Philadelphia Gas Trust, do the same thing for Philadelphia?"

The following list of Companies in New York and vicinity are corrected weekly by GEORGE H. PRENTISS, Broker and Dealer in Gas stocks, No. 30 Broad street, N. Y.

Companies in New York and vicinity.	Capital Stock.	Par.	Dividends. Rate per an.	Am. of last.	Date of last.	Quotat'ns Bid.	As'd
	$						
Mutual, N. Y.	5,000,000	$100	10%	2½	Oct. '77	90	93
" Gold Bonds	90,000	1,000	7%	3½	Feb. '77	100	103
N. York "	4,000,000	....	10%	5	May '77	126	127½
Metrop. "	2,500,000	100	10%	5	June '77	127	130
" " Certf.	1,000,000	....	7%	3½	" '77	100	103
" " Bonds	500,000	1,000	7%	3½	" "	102	—
Harlem "	1,850,000	50	8%	3½	Aug. '77	95	100
Manhat. "	4,000,000	50	...‡	5	July '77	195	200†
Brooklyn, B'klyn.	2,000,000	52	15%	5	July '77	165	175
Nassau, "	1,000,000	25	...‡	4	July '77	76	80
" " Certf.	700,000	1,000	7%	3½	July '77	98	101
People's, "	1,000,000	10	...‡	3½	July '76	—	45
" " Certf.	300,000	1,000	7%	3½	July '77	80	85
" " B'ds	325,000	....	7%	3	Feb. '77	96	100
Metrop. "	1,000,000	10	5%	2½	May '77	67½	72
Wmsb'rg "	1,000,000	50	10%	2½	July '77	115	122½
" " Certf.	1,000,000	....	7%	3½	July '77	100	102
Citizen's "	1,200,000	20	...‡	4	Jan. '77	77	82½
" " Certf.	320,000	1,000	7%	3½	Oct. '77	97	100
J. C., N. J.	750,000	20	10%	5	July '77	160	—
Cent. Westch. N.Y	466,000	50	7%	4	July '77	80	90
Subur'n " "	295,000	50	7%	3½	Oct. '77	90	100
Municipal, N.Y.	1,500,000	100	.....	.....	.....	75	80

‡ Paid irregularly.

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ADVERTISERS' INDEX.

Air Compressors: *Page.*
Clayton, James, Brooklyn, N.Y..... iii
Norwalk Iron Wks. Co., S. Norwalk. iii
Rand & Waring, New York..... x

Assaying Tools and Chemicals:
Benjamin, E. B., New York vi
Boulter's Superior Muffles, Phila.... 324
Burlingame, E. E. & Co., Denver, Colo. i
Kalb, Theo., St. Louis, Mo..... 324
Riethmann J. & Co., Denver, Colo.... 324

Attorneys and Counsellors:
Bloss, John B., Washington, D. C..... vii
Britton & Gray, Washington, D. C..... vii
Mendenhall, W. K., Washington, D. C. vii
Morrison & White, Georgetown, Colo.. vii
Riley, Henry A., New York..... vii

Bankers and Brokers:
Tracy, Arnold & Co., New York..... vii
Van Deventer & Patton, New York.... vii

Blasting Powder:
Laflin & Rand Powder Co., New York. viii
Oliver, Paul A., Wilkes-Barre, Pa..... viii
Miners' Supply Co. (Blasting Squibs), 324
Miners' Powder Co., New York..... x

Blowers:
Keystone Portable Forge Co., Phila., Pa. v

Boiler Covering and Roofing:
Johns Manufacturing Co., H. W..... i

Books and Periodicals:
Capital and Labour, London, Eng..... vii
Claxton, Remsen & Haffelfinger, Phila. v
Colliery Guardian, London, Eng..... vii
El Minero Mexicano, New York..... vii
La Houille, Paris, France..... vii
Smith, Fred. H., Baltimore, Md..... i
Spon, E. and F. N., New York iii
Teknish Tidskrift, Stockholm, Sweden. vii
Van Nostrand's Engineering Works... iv
Van Nostrand's Eclectic Magazine, N.Y. viii

Cement:
Fleming, Howard, New York..... viii
Merchant, Anderson, & Co., New York.. ix

Coal:
Berwind, White & Co., New York..... viii
Borda, Eugene (Koh-i-noor Coal), Phila ix
Borden & Lovell, New York..... viii
Brown, S. H. & Co., New York..... viii
Cannelton Coal Co., Philadelphia..... ix
Consolidation Coal Co., Baltimore, Md. ix
Coxe Bros. & Co., New York..... ix
Cox & Boyce, New York..... viii
Heissenbuttel & Wells, New York.. .. ix
Hoboken Coal Co., New York..... .. ix

Page
Kanawha Coal Lands For Sale..... ix
Kittaning Coal Co., Philadelphia, Pa... viii
Lehigh Valley Coal Co., New York.... viii
Maryland Coal Co., New York..... ix
Pardee, A. & Co., New York..... ix
Phila. & Reading Coal & Iron Co.... viii
Shaw Brothers, Baltimore, Md x
Swords, A. S., New York..... viii
Talbot, Richmond, New York..... ix
Williams, R. H., New York..... viii

Coal and Ore Separators:
Bradford, H., Philadelphia..... viii
Fraser, Chalmers & Co., Chicago, Ill... vi
Krom, Stephen R., New York..... ii
Wetmore, George C., New York..... ii

Copper Works
Pope, Cole & Co., Baltimore, Md..... iv

Engineers and Chemists:
Courtis, Wm. C., Wyandotte, Mich.... vii
Degenhardt, G. C. Louis, New York.. vii
Garbutt, Abbott Bros., & Woodward, Lake City, Colo..... vii
Hale, A. W., New York..... vii
Hartleben, Otto, Georgetown, Colo.... vii
Hill, John W., Hamilton, O..... vii
Johnson, Albert, Georgetown, Colo.... vii
Keyes, W. S., San Francisco, Cal..... vii
Marsh, George E., Georgetown, Colo... vii
Neu, Gus. S., New York..... vii
Nicolls, William J., Baltimore, Md..... vii
Randolph, John C., New York..... vii
Reichenecker, Albert, Fairplay, Colo... vii
Rothwell, Richard P., New York..... vii
Sayr & Parmelee, Georgetown, Colo... vii
Teal, Foster & Co., Georgetown, Colo. vii
Vinton, Genl. F. L., Denver, Colo..... vii
Wilson Bros. & Co. Philadelphia..... vii
Woods, Wm. H. Caribou, Colo..... i
Wurtz, Professor Henry, Hoboken, N. J. vii

Emery Wheels:
New York Belting and Packing Co..... ii

Engineers' Instruments:
Edgerton, N. H., Philadelphia..... vi
Gurley, W. & C. E., Troy, N.Y..... —
Heller & Brightly, Philadelphia..... vi

Fire Brick:
Colson, Chas. D., Chicago, Ill..... 323
Evens & Howard, St. Louis, Mo..... —
Kreischer, B., & Son, New York..... 323
Mauer, Henry, New York..... 324

Gas Process:
Mackenzie & Sayre Mfg. Co., New York. v
Stevens, S. A. & Co. (Lowe Process), Philadelphia, Pa..... iv

Page.
Hoisting Machinery:
Crane Bros. Mfg. Co., Chicago, Ill..... iii
Copeland & Bacon, New York..... x

Hotels:
Crawford House, Colorado Sp'ngs, Colo. 324
Teller House, Central City, Colo..... x
Victoria Hotel, South Pueblo, Colo.... 324

Hydraulic Jacks and Punches:
Dudgeon, Richard, New York..... vi
Lyon, E., & Co., New York..... i

Injectors:
Jainison, J. C., New York 234
Wilde, R. W., New York..... v

Locomotives:
Burnham, Parry, Williams & Co., Phila.. iii

Metal Brokers:
White, Edward P., New York..... iv

Mining Tools and Goods
Tritch, George, Denver, Colo..... vi

Machinists' Tools & Machinery
Pratt & Whitney Co., The, Hartford, Ct. —
Prentiss & Co., H., New York..... 324
Wood & Light Machine Co., Worcester 324

Mineral Wool:
Elbers, Alexander D., New York..... 324

Mining, Crushing, Stamping, and Smelting Machinery:
Adams, B. C., Denver, Colo..... iii
Aitchison, R. & Co., Chicago, Ill iv
Black Hawk Foundry & Mach. Wks, Colo 324
Blake's Stone Breaker, New Haven.... vi
Copeland & Bacon, New York..... x
Copeland, Dodge & Co., New York..... vi
Council Bluffs Iron Works..... v
Fraser, Chalmers & Co., Chicago, Ill.... vi
Frue Vanning Machine, Chicago, Ill.... v
Hartford Foundry & Mach. Co., Conn.. v
Hull & Belden Co., Danbury, Conn..... ii
Hendrie Bros. & Bolthoff, Central, Colo. iv
Krom, Stephen R., New York..... ii
Morey & Sperry, New York..... x

Oil.
Lester Oil Co., New York..... 324

Patents:
Lurmann, F., Germany..... —

Pumps:
Carr, A., Selden Direct-Acting, N. Y... ii
Cameron, A. S., New York..... iii
Clayton, James, Brooklyn,..... iii
Crane Bros. Mfg. Co., Chicago..... iii
Davidson, M. T., New York..... iii
Guild & Garrison, Brooklyn, N. Y..... iii
Harris Steam Pump, New York iii
Knowles Steam Pump, New York..... —
Norwalk Iron Works Co..... ... iii
Worthington, H. R., New York..... ii

Page
Railroads and Transportation:
Atchison, Topeka & Santa Fe R.R.... 324
Colorado Central RR..... 324
Denver & Rio Grande RR..... 324
Denver, South Park & Pacific RR. 324
Pennsylvania RR..... 324

Roofs, Girders, etc.:
Scaife, Wm. B., & Sons, Pittsburg, Pa. 324

Rock Drills:
Am. Diamond Rock Boring Co., N.Y. x
Burleigh Rock Drill Co., New York.... x
Ingersoll Rock Drill Co., New York... x
Penn. Diamond Drill Co., Pottsville, Pa x
Rand & Waring, New York..... x

Rubber and Belting:
Gutta Percha & Rubber Mfg. Co., N. Y. —
N. Y. Belting & Packing Co., New York ii

Safes and Scales:
Marvin Safe and Scale Co., New York.. i

Smelting and Refining Works:
Crooke Bros., New York..... iii
Stetefeldt Furnace Co. San Francisco Cal vii
United Royal Smelting Works, N. Y... iv

Steam Engines:
Wilde, R. W., New York..... v

Steam Regulators:
National Iron Wks. N. Brunswick, N. J. iii

Steel Works:
Crescent Steel Works, Pittsburg, Pa... viii
Edgar Thomson Steel Co., Pittsburg, Pa. ix
Park, Bro. & Co., Pittsburg..... viii

Tubes and Pipes:
Abendroth & Root Mfg. Co., New York ii
National Tube Works, Boston, Mass... vi
Worthington, H. R., New York ii

Ventilators:
Keystone Portable Forge Co., Phila., Pa. v
Murphy, Francis, Philadelphia..... 324

Water Wheels:
Stout, Mills & Temple, Dayton, O..... v

Wire Rope:
Channon, H. & Co., Chicago, Ill..... iv
Hazard Mfg. Co., Wilkes-Barre, Pa.... iv
Mason John W. & Co., New York..... i

Miscellaneous:
File Covers For Sale..... 309
Lead and Silver Mine for Sale..... i
New Copper Process..... i
Wanted, A Competent Person For Nickel Works..... i
Situation Wanted By An Analytical Chemist..... i

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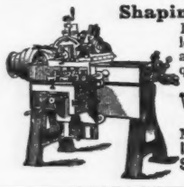

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